# Psychological mechanisms underlying the relationship between childhood trauma and psychosis

## Exploring the role of emotion regulation

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# Volume I: Systematic review and empirical research project

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## Systematic Review

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# The relationship between childhood trauma and difficulties in emotion regulation: a systematic review

Supervised by Dr Amy Hardy, Dr Caroline Lawlor and Dr Claire Hepworth

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## Abstract

**Aims:** There is now a very large research literature showing that childhood trauma has enduring consequences that can span across many areas of a child's development. Since early emotion-regulatory processes emerge within the context of a caregiver-child relationship, disruptions in the development of emotion regulation skills are thought to be a common consequence of childhood abuse. A comprehensive investigation of this relationship would be a useful addition to the literature, given the increasing recognition of shared processes across a range of disorders and recommendations to adopt a mechanism-focused approach. This review sought to identify, summarise and critically evaluate studies that investigated the relationship between childhood abuse and emotion regulation in adults with a diagnosed mental health disorder.

**Method:** Searches of electronic databases Embase, PsycINFO and Medline were conducted. After screening, papers relevant to the review question were examined in more detail and quality assessment ratings were completed.

**Results:** Overall, 549 studies were identified through searches. After inclusion and exclusion criteria were applied, a total of 10 studies met criteria and were included in the review. These included 1,431 participants with a variety of clinically significant mental health problems. Quality varied across studies and some frequent methodological limitations were identified.

**Conclusion:** Findings provide evidence for a specific link between childhood abuse, particularly childhood emotional abuse, and emotion regulation difficulties. Findings also provide some evidence that emotion regulation difficulties may, in part, explain the relationship between childhood abuse and mental health difficulties later in life. However, due to the methodological issues raised and the small number of studies reviewed, it is not possible to draw firm conclusions and further investigation is needed. Recommendations are made to improve the methodological quality of future studies and to encourage consistency in research aims and methods.

# 1 Introduction

Exposure to trauma early in life is common and can have a considerable impact on individuals, families and society, across a range of health and psychosocial outcomes. Understanding how childhood trauma leads to these outcomes is therefore important, as it may inform the development of targeted treatments. Since early emotion-regulatory processes emerge within the context of a caregiver-child relationship, it is likely that trauma early in life leads to disruptions in the development of adaptive emotion regulation skills (Cicchetti & Toth, 1995). This review will focus on systematically examining the literature investigating associations between childhood trauma and emotion regulation among adults with clinically significant mental health issues.

## 1.1 Childhood trauma

### 1.1.1 Definition and prevalence

Childhood trauma, in the form of childhood abuse (CA), is any action by another person which causes significant harm to a child (Butchart, Putney, Furniss, & Kahane, 2006). CA can be physical, sexual or emotional and the nature, timing, severity and duration of the abuse are likely to influence its impact on the child's future mental health and well-being. CA can also take the form of neglect, which involves a persistent failure to meet a child's basic physical and/or psychological needs by providing them with a lack of love and/or care and attention. In a recent UK report, neglect was found to be the most common reason for taking child protection action, with over 25,500 children identified as needing protection from neglect that year (Bentley, O'Hagan, Raff, & Bhatti, 2016). Whilst it is difficult to accurately estimate the prevalence of CA, research in recent years indicates that a significant proportion of children experience abuse. For example, in a survey of nationally representative British youths, it was estimated that one in five children in the UK today have experienced serious physical abuse, sexual abuse or severe physical or emotional neglect at some point in their lifetime (Harker et al., 2013). In addition, this report estimated that for every child identified as needing protection from abuse, another eight are experiencing maltreatment.

### 1.1.2 Methodological issues

Despite the importance of assessing CA, the validity of reported memories of CA has been questioned (Loftus, Polonsky, & Fullilove, 1994; Williams, 1994). Retrospective reports may be influenced by errors of reminiscence, recall bias and/or be influenced by an individual's current mood state or symptomatology (Coleman et al., 2016). Furthermore, some individuals have reported delayed recall of forgotten abuse, a loss of memory that some authors refer to as "repression" or "dissociative amnesia". There are also ethical considerations associated with the assessment of CA and some individuals who have experienced abuse may not want to disclose it for fear of recounting a painful experience (Williams, 1994). In line with this, research examining the accuracy with which people report CA suggests a considerable under-reporting of abuse experiences (Maughan, Pickles, & Quinton, 1995; Widom & Morris, 1997). Nonetheless, sufficiently reliable and valid measures for the assessment of CA have been developed (e.g. Childhood Trauma Questionnaire; Bernstein et al., 2003) and are used widely in research examining the prevalence, correlates and consequences of CA.

### 1.1.3 Long-term consequences of childhood trauma

In recent years, substantial evidence has accumulated to show that CA has enduring consequences that can span across many areas of a child's development and serve as a significant risk factor for maladjustment and psychopathology in adulthood (Brier & Richards, 2007; Cicchetti, Ackerman, & Izard, 1995; Felitti et al., 1998). Research focusing on both community and clinical samples have consistently reported associations among childhood physical, sexual and emotional abuse and a variety of negative long-term outcomes such as depression, substance abuse, post-traumatic stress disorder (PTSD) and suicidal ideation in adulthood (Briere & Runtz, 1988; Fergusson, Boden, & Horwood, 2008; Min, Farkas, Minnes, & Singer, 2007; Rowan, Foy, Rodriguez, & Ryan, 1994; Schaaf & McCanne, 1998). Interpersonal trauma, such as CA, has been argued to be associated with a much more complex pattern of clinical symptomatology than typical PTSD (Herman, 1992). For this reason, a dissociative subtype of PTSD was included in the DSM 5 (American Psychiatric Association, 2013) and it has been

proposed that a "sibling disorder" of complex PTSD be included in the eleventh revision of the International Classification of Disease (ICD-11; Maercker et al., 2013). It is proposed that complex PTSD is different as it arises after exposure to a traumatic stressor that is typically of a prolonged and repeated nature, and from which escape is difficult or impossible. Alongside the core symptoms of PTSD, trauma of this kind can also lead to the the development of persistent and pervasive impairments in affective, self and relational functioning, including difficulties in emotion regulation, beliefs about oneself as diminished, defeated or worthless and difficulties in sustaining relationships (Cloitre, Miranda, Stovall-McClough, & Han, 2005; Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Cole, Martin, & Dennis, 2004; Ehring & Quack, 2010; Herman, 1992; Pelcovitz et al., 1997). However, while some authors have provided preliminary support for this unique variation of PTSD (Murphy, Elklit, Dokkedahl, & Shevlin, 2016; Nickerson et al., 2016), others have concluded that the available evidence does not support a new diagnostic category at this time (de Jongh et al., 2017; Resick et al., 2012).

## 1.2 Emotion regulation

### 1.2.1 Definition

Emotion regulation refers to the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions (Thompson, 1994). There are numerous definitions of emotion regulation in the literature and researchers tend to conceptualise it in different ways (see Tull & Aldao, 2015). Some models focus on the *strategies* that individuals use in order to implement some kind of influence on the process through which emotion is generated or manifested in behaviour (Cole, Michel, & Teti, 1994; Gross, 2015; Koole, 2009). For example, Gross' process model of emotion regulation (Gross, 2015) describes the way in which individuals can regulate their emotions at different points in the emotion-generative process (e.g. situation selection, situation modification, attentional deployment, cognitive change and response modulation). According to this model, what emotions one has and how they are expressed are influenced by the type and timing of the emotion regulation strategy the individual uses. Other models take a step back from the particular emotion regulation strategies an individual uses and instead place emphasis on emotion regulation *abilities* that

influence the typical ways in which individuals understand, regard, and respond to their emotional experience (Gratz & Roemer, 2004; Hofmann, & Kashdan, 2010; Thompson, 1994). For example, Gratz and Roemer (2004) have proposed a clinically useful multidimensional model which conceptualizes emotion regulation as adaptive responses to emotional distress (versus efforts to control or suppress emotional arousal). The authors define emotion regulation as a construct that is characterised by four dimensions: (a) awareness and understanding of one's emotions, (b) acceptance of negative emotions, (c) the ability to successfully engage in goal-directed behaviour and control impulsive behaviour when experiencing negative emotions, and (d) the ability to use situationally appropriate emotion regulation strategies. Thus, emotion regulation abilities can be considered a higher order process that likely influence the type of emotion regulation strategies an individual uses in any given situation, as well as the ultimate success of those strategies (Tull & Aldao, 2015).

### 1.2.2 Assessment of emotion regulation

Several self-report measures assessing both emotion regulation strategies (e.g. Emotion regulation questionnaire; Gross & John, 2003) and abilities (e.g. the Difficulties in Emotion Regulation Scale; Gratz and Roemer, 2004) have been developed and are widely used in the literature. There are currently advances in trying to compliment these measures with more ecologically valid methods, such as experience sampling methods (ESM; Csikszentmihalyi & Larson, 1987) and ecological momentary assessment (EMA; Stone & Shiffman, 1994).

## 1.3 The impact of childhood trauma on emotion regulation: attachment theory

The proposal that exposure to chronic interpersonal CA can contribute to emotion regulation difficulties is based on findings from developmental psychology. A basic premise of classic developmental attachment theory (Bowlby, 1969) is that early interactions and experiences with primary caregivers form a critical context for concurrent and later emotion regulation and interpersonal interactions. For this reason, some researchers have suggested that the quality of a child's attachment to their caregiver can contribute to individual differences in the management and regulation of emotions and responses in interpersonal situations (Mikulincer &

Shaver, 2007; Wei, Vogul, Ku, & Zakalik, 2005). Bowlby's (1988) attachment theory proposes that a secure attachment relationship is one in which children can turn to the attachment figure during times of danger, stress or novelty, find that the attachment figure is available and responsive and be comforted in a way that allows them to feel safe and return to exploration. In secure attachment relationships, parents directly intervene to manage children's emotional reactions by soothing distress, engaging in play, providing reassurance in uncertain circumstances and offering assistance in emotionally demanding situations (Thompson & Meyer, 2007). Over time and with repeated positive experiences, the child internalises these emotion regulation strategies, learns to understand their own emotions and develops confidence in the helpfulness and trustworthiness of others (Adamson & Frick, 2003). These experiences embed developing capacities for distress tolerance and emotion regulation and, as infants get older, they begin to actively engage in strategies to manage distress by reaching towards caregivers for comfort, self-soothing (e.g. playing with a special toy or blanket) or avoiding unpleasant situations (e.g. turning their gaze away from something that is upsetting them).

The reactions of caregivers to their children's emotional expressions therefore influence the development of emotion regulation abilities. When caregivers respond to a child's emotions in a supportive, sympathetic and constructive way, this teaches the child that their feelings are valid and important and provides them with opportunities for learning adaptive ways of relating to and managing their emotions. For example, caregivers may suggest specific strategies that might be helpful such as cognitive reframing ("She didn't mean to hurt you"), problem-focused coping ("What can you do differently") or attention-shifting ("Let's think of another game to play instead"). This enhances young children's ability to use situationally appropriate emotion regulation strategies and the caregiver's encouragement of these strategies contributes to the child developing beliefs that they can cope with difficult situations and manage their feelings (Thompson & Goodman, 2010). Emotion regulation is also socialised in the context of everyday conversations in which parents and children comment about their own feelings or the emotions of others (Thompson, Laible, & Ontai, 2003). Alongside the caregiver's response to displays of emotion, these interactions influence the

child's developing beliefs about emotions, such as expectations concerning the nature of emotions and how they should be expressed. In line with this, studies in the developmental literature suggest that, when compared with insecurely attached children, those with secure attachment relationships report greater emotional awareness, greater skills in identifying and labelling emotions and a better knowledge of emotion regulation strategies (Brumariu et al., 2012; Colle & Del Giudice, 2011; Steele, Steele, & Croft, 2008).

However, when distress is not easily tolerated by a parent and the parent responds to the child in an overly emotional, exaggerated, or chaotic way, the child is likely to internalise an exaggerated sense of his or her own distress as being unmanageable. According to Marsha Linehan's (1993) biosocial model of invalidating environments in borderline personality disorder, an invalidating environment, where communication of private emotional experiences is met by erratic, inappropriate and extreme responses, is crucial to understanding the development of emotion regulation difficulties. These environments are characterised by intolerance towards the expression of emotions, especially displays of negative emotion which, rather than being validated, are often dismissed, punished or trivialised. These responses add stress to the challenges of emotion regulation by further exacerbating the negative emotions that the child is trying to manage. In addition, through the caregiver's failure to recognise and validate emotional expression, opportunities to learn how to label emotional experiences, tolerate distress and manage emothional arousal are lost. Ultimately, the child is left to control his or her emotions on their own which may result in the use of less adaptive and/or flexible emotion regulation strategies being used. Invalidating environments may intermittently reinforce extreme expressions of emotion as a means of eliciting support from caregivers while also communicating to the child that such emotional displays are unwarranted and feelings should be dealt with internally and without parental support (Linehan, 1993). These conflicting messages may contribute to emotions being experiened as frightening and overwhelming and result in the development of unhelpful beliefs about emotions (e.g. "I must not get upset", "I should cope with my emotions on my own", "extreme displays of emotions are the only way of getting my needs met"). These beliefs are likely to then influence the strategies that the child uses to

manage their emotions, for example teaching them to suppress or heighten their emotional expressions.

In line with this, research indicates that growing up in an abusive environment limits a child's opportunities to learn how to recognise and understand emotions, especially negative emotions such as anger, fear and sadness (Pollak & Sinha, 2002; Shipman, Zeman, Penza, & Champion, 2000). The attachment literature also supports this association and children with insecure attachments have been found to be more likely to have a diminished emotional self-awareness, to supress negative emotions and to have difficulty regulating emotions and recovering from episodes of upset, distress or mood liability (Brenning, Soenens, Braet, & Bosmans, 2012; Shields & Cicchetti, 1997). Furthermore, negative, invalidating evaluation of emotions and the development of secondary emotional responses (e.g. fear or shame) may motivate attempts to avoid emotions altogether (Gratz, Tull, & Wagner, 2005; Greenberg & Safran, 1987). Overall, the literature indicates that, compared to non-abused children, those who have experienced abuse are less likely to adaptively respond to their emotions (e.g. Browne & Finkelhor, 1986; Cicchetti & Howes, 1991; Shipman et al., 2007) and more likely to have difficulties in accepting emotions and controlling actions in the context of emotional distress (Burns, Jackson, & Harding, 2010; Gratz & Roemer, 2004; Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007; Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008).

## 1.4 Emotion regulation and mental health

In recent decades, research has consistently demonstrated that difficulties in the ability to adaptively manage emotions are related to the development, maintenance and treatment of various forms of psychopathology (Berking & Wupperman, 2012), such as depression (Gross & Muñoz, 1995), borderline personality disorder (BPD; Leible & Snell, 2004), substance-use disorders (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004) and eating disorders (Fairburn, Cooper, & Shafran, 2003). In addition, there is some evidence to suggest that emotion regulation may mediate the association between CA and mental health difficulties later in life and findings appear most robust for childhood emotional abuse. For example, Kuo and colleagues (2015) found that while there was no evidence of a

significant direct relationship between childhood emotional abuse, physical abuse or sexual abuse and BPD features, there was an indirect relationship between childhood emotional abuse and BPD features through difficulties with emotion regulation. Similarly, Burns and colleagues (2012) found that difficulties in emotion regulation mediated the impact of emotional abuse on eating disorder symptom severity. This indicates that emotion regulation difficulties, which may develop as a consequence of CA, might be an important mechanism connecting the experience of childhood trauma with subsequent difficulties later in life.

## 1.5 Aims of the current review

Research has increasingly explored whether emotion regulation is a mechanism accounting for the relationship between CA and mental health problems. However, the vast majority of studies have employed undergraduate samples, which may limit generalisability to clinically significant difficulties occurring across the lifespan. To our knowledge, there have not yet been any reviews of the impact of CA on emotion regulation within adult clinical populations. Comprehensive investigation of this relationship would be a useful addition to the literature given the increasing recognition of shared processes across a range of disorders and recommendations to adopt a mechanism-focused approach to assessment and treatment (Holmes, Craske, & Graybiel, 2014). The aim of this review is therefore to systematically review the literature investigating the relationship between CA and emotion regulation in adults with a diagnosed mental health disorder.

# 2 Method

## 2.1 Search strategy

Searches of electronic databases Embase (1974 to August week one), PsycINFO (1806 to August week one) and Medline (1946 to August week one) were conducted on the 2nd August 2016. To identify studies relevant to the research question, a comprehensive list of search terms was developed by reviewing MESH terms for 'trauma' AND 'emotion regulation'. The specific search terms included were: child* abuse OR child* maltreat* OR child* trauma* OR child* victim* OR child* advers* AND emotion* regulat* OR emotion* dysregulat* OR affect* regulat* OR affect* dysregulat*. Reference lists and citations of included articles were also searched. This identified 549 studies in total after duplicates were removed. The title, abstract and assessment measures of each citation were then screened against the inclusion and exclusion criteria. Eighty-nine citations potentially met inclusion criteria based on their titles, abstracts and the assessment measures employed and their full text copies were retrieved and examined. On examination of full text copies, 10 studies met the inclusion criteria for the review. See Figure 1 for an outline of the search procedure.

## 2.2 Inclusion and exclusion criteria

Current Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Liberati, Tezlaff, & Altman, 2009) and Centre for Reviews and Dissemination (CRD; Mohr, Liberati, Tetzlaff, & Altman, 2009) guidelines were adhered to when conducting the systematic review. Studies were assessed for inclusion in terms of the population characteristics, study design and publication details, as well as the assessment of the relevant variables (CA and emotion regulation). In order to be included in this review, studies were required to have an adult sample (i.e. 18 and above) recruited from a clinical population (i.e. individuals with a diagnosed mental health disorder who are currently in contact with services). It was also required that studies be empirical and published in English in a peer-reviewed journal. Qualitative reports, case studies, personal accounts, unpublished dissertations and review articles were excluded. No date limits were set. In order to address the research question, it was essential that

included studies assessed CA (i.e. physical, sexual, emotional abuse and/or neglect) and emotion regulation. Studies assessing other aspects of emotional experience (e.g. emotional expression, neurobiological aspects of emotion) were excluded. In addition, studies were only included if they used a standardised and validated measure of emotion regulation and CA. Studies were excluded if they assessed the variables of interest but did not report the results in the article so relevant information could not be extracted.

## 2.3 Quality assessment

The included studies were all cross-sectional in nature and there is currently no consensus regarding critical appraisal tools to assess cross-sectional studies (Sanderson, Tatt, & Higgins, 2007). An approach based on Arcelus, Haslam, Farrow and Meyer (2013) was employed to decide which general methodological factors would most impact on the reliability and validity of the research findings. This review drew on a checklist for cross-sectional studies developed by Gilbert (2009) based on the NICE checklists (NICE, 2007). The tool rates studies based on the following criteria: how appropriately and clearly focused the research question is, the appropriateness of recruitment, how representative cases were of the relevant population, whether the study indicates consent rate, whether inclusion criteria were made explicit and sample characteristics described sufficiently, level of confidence in the quality of individual responses, whether the outcome was measured in an objective, standard, valid and reliable way, whether main potential confounders were taken into account, appropriateness of statistical analysis and whether actual P values were reported. See appendix 1 for a copy of this assessment tool.

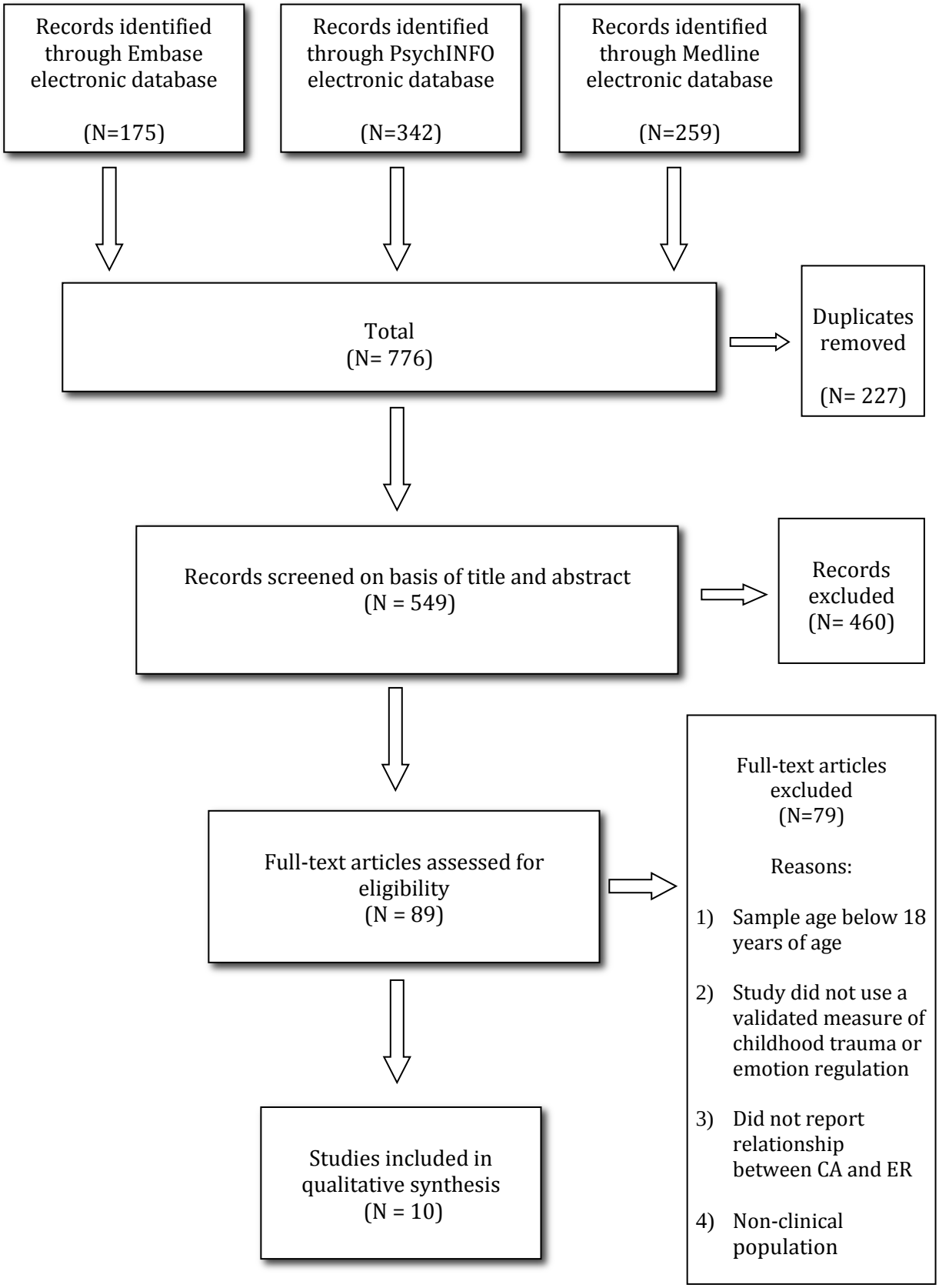


**Figure 1**: Search procedure

# 3 Results

## 3.1 Overview of studies

Ten studies met the inclusion criteria. Table 1 summarises the studies' sample characteristics and overall quality rating. Table 2 summarises the aims, design and assessment measures employed to assess the relationship between CA and emotion regulation. It also details the statistical analyses used and outlines the main study findings. Seven studies specifically sought to investigate the relationship between CA and emotion regulation and explicitly referred to this in their aims. Five studies recruited substance misuse samples (Banducci, Hoffman, Lejuez, & Koenen, 2014; Gratz et al., 2007; Gratz et al., 2008; Karagöz, Dağ, Tezel, Kışlak, & Boysan, 2015; Weiss, Tull, Lavender, & Gratz, 2013), one included a mixed sample of psychiatric outpatients (Choi, Choi, Gim, Park, & Park, 2014) and one included people with a diagnosis of anorexia nervosa (Racine, & Wildes, 2015). One study included a sample of patients with a diagnosis of Major Depressive Disorder (MDD; Hopfinger, Berking, Bockting, & Ebert, 2016), one included a mixed sample of patients with Borderline Personality Disorder (BPD) and Bipolar II disorder (BP II; Fletcher, Parker, Bayes, Paterson, & McClure, 2014) and another included a mixed sample of patients with MDD and Borderline Personality Disorder (BPD; Fernando et al., 2013). Fernando and colleagues (2013) also compared both clinical groups with each other and with a sample of non-clinical controls. Nine of the studies recruited a mixed sex sample and one (Karagöz et al., 2015) included males only.

In relation to trauma, the majority of studies focused on CA only, with two (Choi et al., 2014; Weiss et al., 2013) also assessing for trauma in adulthood using the Life Events Checklist (Blake et al., 1990). To measure CA, nine of the studies used the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003), a self-report instrument developed to provide brief, reliable and valid assessment of a broad range of traumatic experiences in childhood. The questionnaire is comprised of 28 items that fall into five subscales: emotional abuse (CEA), physical abuse (CPA), sexual abuse (CSA), emotional neglect (CEN) and physical neglect (CPN). Items are rated on a 5-point Likert scale and higher scores indicate higher levels of reported

abuse, with established cut-offs for determining rates of different types of abuse (Bernstein & Fink, 1998). One study (Fletcher et al., 2014) measured CA using the Measure of Parental Style (MOPS; Parker, 1989) which assesses perceieved parental styles (with responses obtained separately for the mother and father) across three domains: abuse (psychological, emotional or physical; e.g. 'physically violent or abusive of me'), indifference (e.g. 'uninterested in me') and over-control (e.g. 'overprotective of me'). Each item is answered on a 4-point Likert scale and higher scores indicate more dysfunctional parenting.

To measure emotion regulation, nine of the 10 included studies used the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). This 36-item questionnaire has been empirically validated and was developed based on Gratz and Roemer's (2004) multidimensional model of emotion regulation. The questionnaire consists of six subscales: non-acceptance of emotional responses (non-acceptance), difficulties engaging in goal-directed behavior when distressed (goals), difficulties controlling impulsive behaviours when distressed (impulse), lack of emotional awareness (awareness), limited access to emotion regulation strategies (strategies) and lack of emotional clarity (clarity). Items are scored on a 5-point Likert scale and higher overall and subscale scores indicate greater difficulties in emotion regulation. One study (Hopfinger et al., 2016) used the Emotion Regulation Skills Questionnaire (ERSQ; Berking & Znoj, 2008) and two studies administered an additional measure of emotion regulation alongside the DERS. Fernando and colleagues (2013) administered the Emotion Regulation Questionnaire (ERQ; Abler & Kessler, 2009; Gross & John, 2003) alongside the DERS in order to measure the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression. Fletcher (2014) and colleagues administered the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, & Kraaij, 2006) in order to measure the use of nine cognitive strategies for regulating emotion in response to threatening or stressful life events. All included studies assessed the relationship in question using a cross-sectional design. Five of the studies used between group comparisons and/or bivariate correlations to assess the relationship (Choi et al., 2014; Fletcher et al., 2014; Gratz et al., 2008; Racine et al., 2015; Weiss et al., 2013), whilst the remaining five studies employed multivariate regression analyses. Seven of the studies conducted further analysis

exploring emotion regulation as a mediator of the relationship between CA and clinical symptomology (Choi et al., 2014; Fernando et al., 2013; Gratz et al., 2007; Gratz et al., 2008; Hopfinger et al., 2016; Racine et al., 2015; Weiss et al., 2013). The findings of the studies and their limitations are discussed below.

## 3.2 Methodological quality of reviewed studies

The quality scores for each study are presented in Table 3. The lowest quality score was seven out of a possible 20 and the highest score was 14, suggesting the quality of future studies investigating the relationship between CA and emotion regulation could be improved. The studies were allocated to 'low' (0-8), 'medium' (9-12), and 'high' (13-14) quality studies based on the range identified. One study (10%) was assessed to be of low quality, five (50%) were rated medium and four (40%) were of high quality. In general, the lower quality studies either failed to describe their inclusion and exclusion criteria and/or provide sufficiently detailed information about the sample. In addition, lower scoring studies did not identify and control for a range of possible confounders and/or only analysed the questionnaires total scores rather than examining the full range of associations between types of abuse and the sub-dimensions of emotion regulation. All studies used comparable, standardised and validated self-report measures to assess trauma and emotion regulation and so they did not differ in the quality of the measures used.

**Table 1** : Summary of study characteristics

| Authors, year and country | Title | Sample | N | Female (%) | Age Mean (SD) |
|---|---|---|---|---|---|
| Banducci et al., 2014<br><br>USA | The impact of CA on inpatient substance users: specific links with risky sex, aggression, and emotion dysregulation | Patients receiving treatment for substance misuse | 280 | 30.3% | 43.30 *(*9.79) |
| Choi et al., 2014<br><br>Korea | The effects of CA on symptom complexity in a clinical sample: Mediating effects of emotion regulation difficulties | Psychiatric outpatients | 162 | 55.6% | 40.20 (15.44) |
| Fernando et al., 2013<br><br>Germany | The impact of self-reported childhood trauma on emotion regulation in borderline personality disorder and major depression | Patients with a primary diagnosis of BPD (N=49), MDD (N=48) and healthy controls (N=63) | 160 | BPD (89.8%)<br><br>MDD (54.2%)<br><br>Non-clinical controls (65.1%) | BPD: 28.63 (8.99)<br><br>MDD: 33.15 (8.89)<br><br>Controls: 31.44 (9.98) |
| Fletcher et al., 2014<br><br>Australia | Emotion regulation strategies in bipolar II disorder and borderline personality disorder: Differences and relationships with perceived parental style | Patients with a primary diagnosis of BPD (N=24), BP II (N=24) | 48 | BPD (87.5%)<br><br>BP II (50%) | 32.90 (11.30) |

| Authors, year and country | Title | Sample | N | Female (%) | Age Mean (SD) |
|---|---|---|---|---|---|
| Gratz et al., 2007<br><br>USA | A laboratory-based study of the relationship between CA and experiential avoidance among inner-city substance users: the role of emotional non-acceptance | Treatment-seeking substance users | 76 | 33% | 42.20 (8.20) |
| Gratz et al., 2008<br><br>USA | Factors associated with co-occurring borderline personality disorder among inner-city substance users: the roles of childhood maltreatment, negative affect intensity/reactivity and emotion dysregulation | Treatment-seeking substance users | 76 | 33% | 42.21 (8.16) |
| Hopfinger et al., 2016<br><br>Germany | Emotion regulation mediates the effect of childhood trauma on depression | Patients with MDD | 269 | 55% | 43.51 (10.96) |
| Karagöz et al., 2015<br><br>Turkey | The relationship between childhood maltreatment and emotional dysregulation in self-mutilation: an investigation among substance dependent patients | Male alcohol dependent (N=55) and opiate dependent (N=24) patients | 79 | 0% | Addicts with self-mutilation (N=28): 33.86 (10.03)<br><br>Addicts without self-mutilation (N= 51): 46.00 (8.03) |

| Authors, year and country | Title | Sample | N | Female (%) | Age Mean (SD) |
|---|---|---|---|---|---|
| Racine et al., 2015<br><br>USA | Emotion dysregulation and anorexia nervosa: an exploration of the role of CA | Patients with anorexia nervosa | 188 | 95.7% | 26.44 (10.03) |
| Weiss et al., 2013<br><br>USA | Role of emotion dysregulation in the relationship between CA and probable PTSD in a sample of substance abusers | Substance use disorder patients in residential treatment | 93 | 23.7% | 40.62 (9.68) |

**Footnote:** Borderline Personality Disorder (BPD), Major Depressive Disorder (MDD).

**Table 2 :** Summary of study findings

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Banducci et al., 2014 | To examine the relationship between specific types of CA and maladaptive behavioral and emotional outcomes among substance users. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | ANOVA, multiple regression analyses | CEA uniquely predicted DERS total scores ($R^2$= .16, p<.001) when controlling for CSA and CPA. | CSA predicted risky sexual behaviors when controlling for CPA and CEA. CPA predicted aggressive behaviors when controlling for CSA and CEA. Overall, these findings suggest that there is a specific link between particular abuse types and later maladaptive behavioral and emotional patterns. |

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Choi et al., 2014 | To examine whether CA is related to symptom complexity and to investigate whether emotion regulation difficulties mediate the relationship between CA and symptom complexity among an outpatient clinical sample. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | Partial correlation, mediation analyses | CPA ($r=.43$, $p<.001$) and CEA ($r=.41$, $p<.001$), but not CSA, were significantly correlated with DERS total scores when controlling for the presence of adulthood trauma. | CPA and CEA, but not CSA, were significantly associated with symptom complexity when controlling for the presence of adulthood trauma. DERS total scores partially mediated the relationship between CA and symptom complexity. |
| Fernando et al., 2013 | To investigate childhood trauma, emotion regulation difficulties and their associations in a sample of BPD and MDD patients and healthy controls. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS), Emotion-Regulation Questionnaire (ERQ) | Cross-sectional | ANOVA, hierarchical multiple regression | CEA and CEN were significant predictors of DERS total scores ($R^2=.35$, $p<.01$). Gender and CEA predicted unique variance in ERQ expressive suppression scores ($R^2=.15$, $p<.05$) and CEN predicted unique variance in ERQ cognitive reappraisal scores ($R^2=.06$, $p<.01$). | DERS total scores and ERQ expressive suppression scores significantly mediated the relationship between CEA and acute symptomatology in the BPD subgroup. |

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Fletcher et al., 2014 | To determine whether bipolar II and BPD groups differ in terms of emotion regulation strategies and perceived parenting style and to examine the associations between emotion regulation and perceived parenting style in both groups. | The Measure of Parental Style (MOPS) | Difficulties in Emotion Regulation Scale (DERS), Cognitive Emotion Regulation Questionaire (CERQ) | Cross-sectional | ANCOVA, partial correlations | The CERQ-acceptance dimension was negatively associated with perceived paternal abuse ($r=.48$, $p<.05$) and CERQ-blame was positively associated with perceived maternal abuse ($r=.49$, $p<.05$) in the BPD subgroup. | BPD participants scored significantly higher than those with BP II on a number of emotion regulation dimensions (impulse, strategies, self-blame, catastrophise and blame others) and were significantly less likely to use adaptive cognitive emotion regulation strategies. Dysfunctional parenting experiences were related to maladaptive emotion regulation strategies in participants with BP II and BPD, however differential associations were observed across groups. |

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Gratz et al., 2007 | To examine the relationships between CA, experiential avoidance and emotional non-acceptance in a sample of substance users. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS; non-acceptance subscale only) | Cross-sectional | ANOVA, hierarchical regression, mediation analyses | Moderate-severe CSA ($R^2$=.07, p<.05) and CEA ($R^2$=.11, p<.01) significantly predicted emotional non-acceptance when controlling for the presence of current major depression. | Results also provide evidence for heightened experiential avoidance among individuals with moderate-severe CSA, CPA and CEA compared to individuals reporting none-low abuse. Emotional non-acceptance mediated the relationship between CEA and experiential avoidance. |
| Gratz et al., 2008 | To examine the relationships between childhood maltreatment, negative affect intensity/reactivity, emotion dysregulation, and BPD pathology among substance users. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | Hierarchical logistic and multiple regression analyses | CTQ total scores (r=.50, p<.01) were significantly associated with DERS total scores. | CTQ total scores and negative affect intensity/reactivity significantly predicted BPD symptoms. DERS total mediated the relationships between CA and negative affect intensity/ reactivity and BPD symptom count, as well as the relationship between CEA in particular, and BPD diagnostic status. |

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Hopfinger et al., 2016 | To examine emotion regulation as a mediator of the relationship between childhood maltreatment and depression. | Childhood Trauma Questionnaire (CTQ) | Emotion-Regulation Skills Questionnaire (ERSQ) | Cross-sectional | Simple mediation analysis (regression) | CTQ total scores significantly predicted ERSQ total scores ($R^2$=.05, p<.05). | ERSQ total scores partially mediated the association of CA to both depression severity and depression lifetime persistency. |
| Karagöz et al., 2015 | To explore whether emotion dysregulation and its dimensions and childhood maltreatment and its dimensions are associated with self-mutilation among substance users. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | MANCOVA, correlation, stepwise and linear regression | CEA and CEN significantly predicted three specific dimensions of the DERS: impulse ($R^2$=.12, p<.05), goals ($R^2$=.12, p<.05) and strategies ($R^2$=.11, p<.05). | Substance dependents with self-mutilation reported higher scores on the domains of CEA, CEN, CPA and overall DERS than those without self-mutilation. |
| Racine et al., 2015 | To explore whether CA might be related to emotion regulation difficulties and eating disorder symptom severity in patients with anorexia nervosa. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | Pearson correlations, mediation analyses | CEA (r=.34, p<.001) and CSA (r=.19, p<.05) were significantly correlated with DERS total scores. | DERS total scores significantly mediated the relationship between CEA and anorexia nervosa symptomatology. |

| Authors, year and country | A priori aims | Child abuse measure | Emotion regulation measure | Design | Statistical analysis | Main findings in relation to CA and emotion regulation | Other findings |
|---|---|---|---|---|---|---|---|
| Weiss et al., 2013 | To examine associations among CA, emotion dysregulation, and probable posttraumatic stress disorder among substance users. | Childhood Trauma Questionnaire (CTQ) | Difficulties in Emotion Regulation Scale (DERS) | Cross-sectional | T-test, correlation, chi-square, MANCOVA, logistic regression, mediation analyses | Significant moderate associations were found between CEA and DERS total scores ($r=.30$, $p<.01$) and four specific dimensions of the DERS: goals ($r=.28$, $p<.01$), impulse ($r=.34$, $p<.01$), strategies ($r=.33$, $p<.001$) and clarity ($r=.27$, $p<.01$). Moderate associations were also found between CPA and the goals ($r=.29$, $p<.01$) and impulse ($r=.28$, $p<.01$) dimensions of the DERS. CSA was not significantly associated with the DERS total score or the specific sub-dimensions of emotion regulation. | Substance use patients with probable PTSD (vs. non-PTSD) reported significantly greater severity of CA and significantly higher DERS scores. The impulse sub-dimension of the DERS significantly mediated the associations of both CPA and CEA with probable PTSD status. |

**Table 3 :** Study quality ratings

| Quality variable | Study | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Banducci et al., 2014** | **Choi et al., 2014** | **Fernando et al., 2013** | **Fletcher et al., 2014** | **Gratz et al., 2007** | **Gratz et al., 2008** | **Hopfinger et al., 2016** | **Karagöz et al., 2015** | **Racine et al., 2015** | **Weiss et al., 2013** |
| **INTERNAL VALIDITY** | | | | | | | | | | |
| **Relevance of the research question to the current review** | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 1 |
| **SELECTION OF SUBJECTS** | | | | | | | | | | |
| **Appropriateness of recruitment to aims of the research** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Representative cases from relevant population** | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 |
| **Indication of how many asked agreed to take part** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Description of inclusion/exclusion criteria and sample** | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **DATA COLLECTION** | | | | | | | | | | |
| **Confidence in the quality of individual responses** | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| **Outcome is measured in objective, standard, valid and reliable way** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CONFOUNDING** | | | | | | | | | | |
| **Confounders are identified and taken into account** | 2 | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 2 |
| **STATISTCIAL ANALYSIS** | | | | | | | | | | |
| **Appropriate use of statistical analysis** | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 2 |
| **Actual P values reported** | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total quality rating** | 14/20 | 12/20 | 14/20 | 14/20 | 10/20 | 11/20 | 7/20 | 10/20 | 10/20 | 13/20 |

**Ratings:** Well covered (2), Adequately addressed (1), Poorly addressed (0)

## 3.3 Synthesis of study findings

The findings of the studies in relation to their quality are discussed. The results are grouped by the clinical sample they assessed.

### 3.3.1 Substance use

Five of the studies in the current review included a sample of patients receiving treatment for substance misuse (Banducci et al., 2014; Gratz et al., 2007; Gratz et al., 2008; Karagöz et al., 2015; Weiss et al., 2013). All five studies used the CTQ to measure childhood trauma and the DERS to measure emotion regulation. Three of the studies scored in the medium quality range and two scored in the high quality range. All studies reported a significant association between CA and emotion regulation. For example, Banducci and colleagues (2014) found that CEA significantly predicted overall emotion regulation scores, with a medium effect size, even when controlling for CSA, CPA and covariates. Karagöz and colleagues (2015) examined the extent that CA experiences predicted the sub-dimensions of the DERS among substance dependent patients with self-harm. The results indicated that CEA and CEN significantly predicted the goals, impulse and strategies sub-dimensions of the DERS, with a medium effect size. The three sub-dimensions explained 12%, 12% and 11% of variance in CTQ scores respectively.
Weiss and colleagues (2012) also explored the relationship between specific types of abuse and sub-dimensions of emotion regulation. They found significant moderate associations between CEA and the DERS total score. Further analyses indicated moderate positive associations between CEA and the goals, impulse, strategies and clarity sub-dimensions of the DERS. In addition, they found moderate associations between CPA and the goals and impulse sub-dimensions of the DERS. CSA was not significantly associated with the DERS total score or the specific sub-dimensions of emotion regulation. Additional analyses exploring emotion regulation as a mediator of the relationship between CA and PTSD found that the DERS impulse sub-dimension significantly mediated the association of both CPA and CEA with probable PTSD status.

Gratz and colleagues (2007) examined the relationship between CA and the emotional non-acceptance sub-dimension of the DERS. Results indicated that moderate-severe CSA and CEA significantly predicted emotional non-acceptance

with a small to medium effect size. Furthermore, these results remained significant when controlling for the presence of current major depression. Gratz and colleagues (2008) later used the same sample to examine the relationships between CA, negative affect intensity/reactivity, emotion regulation, and BPD symptoms among substance users and found a strong positive correlation between CA and overall emotion regulation. The authors also found that emotion regulation fully mediated the relationship between CA and BPD symptom severity, as well as the relationship between CEA, in particular, and BPD diagnostic status.

### 3.3.2 Major depressive disorder, borderline personality disorder and bipolar disorder II

One study included a sample of patients with MDD (Hopfinger et al., 2016), one included a mixed sample of MDD and BPD patients (Fernando et al., 2013) and one included a mixed sample of BPD and BP II patients (Fletcher et al., 2014). The former scored in the low quality range and the two latter studies scored in the high quality range. Hopfinger and colleagues (2016) used the CTQ and ERSQ to examine whether CA was associated with emotion regulation in a sample of patients with MDD. They found that overall, CA significantly predicted general emotion regulation, though the effect size was small. The authors also explored the impact of emotion regulation on the association between CA and depression and found that difficulties in general emotion regulation mediated the association of CA to both depression severity and persistence. Fernando and colleagues (2013) investigated CA, emotion regulation difficulties and their associations in a combined sample of patients with BPD, MDD and non-clinical controls using the CTQ and the DERS. The ERQ was also used to measure the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression. Results indicated that CEA and CEN were independent, significant predictors of overall emotion regulation, with a large effect size. In addition, this study found that a history of CEN was associated with less frequent use of cognitive reappraisal and a history of CEA was related to more frequent use of expressive suppression. In line with findings by Gratz and colleagues (2008), additional hierarchical regression analyses found that overall emotion regulation difficulties and ERQ suppression scores significantly mediated the relationship between CEA and acute symptomatology in their BPD subgroup, accounting for 32% of variance

in symptom scores. Fletcher and colleagues (2014) also included a mixed sample of participants and examined relationships among emotion regulation and perceived parenting style in both groups. The authors found that maternal and paternal abuse did not correlate with dimensions of emotion regulation in the BP II subgroup. In the BPD subgroup, an abusive paternal relationship was associated with a reduced tendency to use the emotion regulation strategy of acceptance and an abusive maternal relationship was associated with increased self-blame.

### 3.3.3 Anorexia nervosa

One study (Racine et al., 2015), scoring in the medium quality range, explored whether CA was related to emotion regulation in a sample of patients with anorexia nervosa. Results indicated a positive correlation between CEA and CSA and overall emotion regulation scores, with the magnitude of the CEA-emotion regulation relationship being significantly larger (Steiger's Z=2.00, p=.02). CPA was not associated with emotion regulation, as measured by the DERS total score. Mediation analyses revealed that overall emotion regulation significantly explained the relationship between CEA and anorexia nervosa symptomology, and mediation effects did not differ by anorexia nervosa subtype (i.e. restricting versus binge-eating/purging).

### 3.3.4 Mixed psychiatric outpatients

One study (Choi et al., 2014), scoring in the medium quality range, included a sample of psychiatric outpatients with a variety of clinical presentations including depression, anxiety disorders, specific phobias, somatoform disorder, PTSD, substance misuse and other diagnoses not meeting specific diagnostic criteria (e.g. extreme stress reactions). In line with findings by Weiss et al. (2013) among a sample of substance users, Choi and colleagues (2014) found moderate-strong positive associations between CPA and CEA, but not CSA, and overall emotion regulation difficulties when controlling for the presence of adulthood trauma. Additional analyses revealed that emotion regulation partially mediated the relationship of CA with symptom complexity among a psychiatric outpatient sample.

# 4 Discussion

This review aimed to identify, summarise and critically evaluate studies examining whether there is a relationship between childhood trauma and emotion regulation in adults with clinically significant mental health problems. In total, 10 papers were identified and thus only tentative conclusions can be drawn. Nevertheless, the results of this review provide reasonably consistent evidence that CA is related to emotion regulation in adulthood, with all 10 studies reporting significant moderate associations. This relationship appears most robust for reports of CEA, with four out of the 10 studies reporting that this form of abuse was most strongly related to emotion regulation difficulties when controlling for other types of abuse (Banducci et al., 2014; Fernando et al., 2013; Karagöz et al., 2015; Racine et al., 2015). These findings are in line with previous research indicating that CEA, including parent's dismissive, insulting and humiliating attitudes, can have serious negative effects on children's cognitive–emotional development (Claussen, & Crittenden, 1991; Shipman & Zeman, 2001) and these negative consequences can continue into adulthood (Ferguson & Dacey, 1997). In line with the differential effects model (Davis, & Petretic-Jackson, 2000), Fernando and colleagues (2013) suggest that different abuse subtypes most likely contribute to distinct patterns of behavioural and emotional outcomes. They speculate that CEA and CEN in particular, may impact on the core processes of emotion regulation development and therefore, have specifically detrimental effects on emotion regulation compared to other forms of CA. These findings are also in line with Burns and colleagues (2010) who suggest that the greater frequency and chronicity of CEA, as compared to CPA and CSA, places an overwhelming burden on children's ability to effectively regulate and manage negative emotions, resulting in deficits in the development of emotion regulation skills. However, it is also worth noting that trauma types rarely happen in isolation (Bernstein et al., 2003; Gratz et al., 2007; Manly, Kim, Rogosch, & Cicchetti, 2001) and can overlap with each other. For example, CSA, CPA and CPN are likely to involve elements of emotional abuse.

The finding that trauma early in life can disrupt the development of adaptive emotion regulation is not surprising, since early emotion-regulatory processes emerge within the context of a caregiver-child relationship. As has been suggested

by researchers and theorists, parents and other caregivers play a crucial role in structuring, explaining and regulating the emotional world of children (Thompson, 2008). For abused children, their caregivers are less likely to be available to provide support and scaffolding when they are upset, limiting the child's opportunities to learn constructive strategies to regulate their own emotional states (Shipman, Edwards, Brown, Swisher, & Jennings, 2005). In addition, living in an environment that is unpredictable and frightening, children who experience abuse are likely to experience higher than normal levels of arousal and vigilance. Such sustained exposure to stress may alter biological stress responses and produce deficits in children's capacity to effectively regulate their emotions (e.g. Gunnar & Quevedo, 2007).

In recent years, evidence has accumulated to indicate that emotion regulation difficulties are associated with various forms of psychopathology and may be considered a putative trans-diagnostic factor relevant for the development, maintenance and treatment of several mental health disorders (Berking & Wupperman, 2012). In line with this, five of the 10 included studies found that emotion regulation difficulties significantly mediated the association between CEA in particular, and mental health outcomes. These findings provide support for research demonstrating the utilty of a mechanism-focused, transdiagnostic approach to the understanding and treatment of mental health disorders (Barlow et al., 2017). However, more research incorporating multiple patient groups and examining the efficacy of transdiagnostic psychological treatments is needed. Overall, these findings suggest that emotion regulation difficulties may be one pathway through which early life stress, particularly CEA, increases the risk for developing mental health problems later in life. These findings emphasise the importance of future research exploring emotional traumas and their confounding effects on emotion regulation and other domains of development.

## 4.1 Methodological issues and quality factors

The quality assessment tool used in this study proved useful in helping to identify a number of important methodological shortcomings in the current literature. Firstly, despite strong empirical evidence for the validity of the CTQ (Bernstein et al., 2003), the retrospective, self-report nature of the questionnaire means that it

is open to reporting bias, the extent of which is impossible to determine. For example, Colman and colleagues (2016) argue that individual characteristics, experiences and mental health factors may bias the recall of these reports. The authors explored the consistency of reporting childhood adverse experiences over a seven-year period, and found that 39% were inconsistent in their reports of these events. The development of depression, increasing levels of psychological distress, as well as increasing work and chronic stress were associated with an increasing likelihood of reporting a traumatic childhood experience and increases in mastery were associated with reduced likelihood of new reporting of a traumatic experience. Nonetheless, there is also evidence to indicate that trauma histories obtained from those with severe mental difficulties are comparably reliable to the general population (Fisher et al., 2009) and it is thought that individuals tend to under-report trauma experiences rather than providing false-positives (Widom & Morris, 1997). Another limitation of the CTQ is that the format and brevity of the questionnaire prohibits examination of other potentially relevant aspects of abuse that may also impact on emotion regulation. This may limit the specificity of results as the extent to which CA leads to later difficulties has been found to depend upon the nature of the abuse experience, such as the context in which the abuse occurs (Binder, Mcniel, & Goldstone, 1997), the age at which it occurs (Bolger & Patterson, 2001), the relationship of the perpetrator to the survivor (Tremblay, Hébert, & Piché, 1999) and characteristics of the abuse itself, such as severity (Rodriguez, Ryan, Rowan, & Foy, 1996), force (Binder et al., 1997), duration (Binder et al., 1997; Rodriguez et al., 1996), frequency (Jasinski, Williams, & Siegel, 2000) and resulting injury (Johnson, Pike, & Chard, 2001). In addition, none of the studies included measures of childhood experiences beyond abuse, such as additional environmental factors, which may account for the relationship between abuse and negative outcomes.

Another limitation of note is that all included studies relied exclusively on self-report measures of emotion regulation, which may be influenced by an individual's willingness and/or ability to accurately report on their internal experiences. In addition, all 10 studies employed a cross-sectional design and so it is impossible to determine the precise nature of the relationships between the variables of interest, limiting the conclusions that can be drawn. For example, it

may be that the development of mental health problems leads to difficulties in regulating emotions and not the other way around. An additional limitation includes the absence of a control group in all but one of the studies, such that the prevalence of and association between CA and emotion regulation in clinical samples could not be compared and contrasted with samples from the general population. Furthermore, seven out of the 10 studies included only the overall emotion regulation score in their analyses. This limits the specificity of the findings as it does not enable the examination of relationships between abuse subtypes and the different domains of emotion regulation.

## 4.2 Limitations of the current review

The current review is limited by the fact that selection of studies was carried out solely by the author. This may mean that some studies could have been missed from inclusion or bias could have been introduced. Another limitation is the inclusion of studies published only in English, which may account for the majority of studies being conducted in the USA and Europe. In addition, excluding unpublished studies may have biased the review towards those which reported a significant effect of the variable under investigation. The specific search terms chosen will also have inevitably influenced the studies that were identified. For example, while the current review was interested in examining global difficulties with emotion regulation, not including specific emotion regulation strategies in our search terms means that it is possible that relevant literature may not have been identified. Finally, focusing only on studies that recruited from clinical samples could have resulted in important findings being missed and the review is therefore likely to represent a more conservative assessment of the relationship between CA and emotion regulation. However, it was not within the scope of the current review to include both clinical and non-clinical research. Nonetheless, this review does provide some important insights and highlights areas for future research. It also highlights a need for improvement in the quality of research in this area and provides recommendations to encourage more comprehensive assessments of CA and emotion regulation in the future.

## 4.3 Recommendations for future research

Much of the existing literature exploring the relationship between childhood trauma and emotion regulation employs samples of undergraduate university students and, for this reason, only a small number of studies met criteria to be included in the current review. This indicates a need for more research examining childhood trauma and emotion regulation within clinical samples, as the use of convenience sampling may limit generalisability to clinical populations across the lifespan. The review also highlights the utility of research adopting a transdiagnostic perspective for theory and treatment to facilitate the development of treatment components that are effective across a wide range of disorders (Roy-Byrne, 2017). Future research would also benefit from assessing traumatic childhood experiences more comprehensively, including through clinical interviews (e.g. the Early Trauma Inventory; Bremner, Vermetten, & Mazure, 2000), to examine additional trauma characteristics, such as the onset of CA, that might have a particular impact on emotion regulation (Ehring & Quack, 2010). It would also be helpful to assess additional factors that may impact on the development of emotion regulation such as bullying and the individual's neighbourhood environment, as this would provide a more complete picture of factors associated with maladaptive outcomes in adulthood (Mahady Wilton, Craig, & Pepler, 2000; McCoy, Roy, & Raver, 2016). Future studies would also benefit from additional assessments of emotion regulation, such as physiological parameters. For example, the use of experience sampling methods and ecological momentary assessment alongside self-report measures would allow researchers to investigate emotion regulation online and moment by moment using more objective methods. Lastly, this research area would also greatly benefit from more research employing a longitudinal design so that insight into the causality among relationships could be provided.

## 4.4 Clinical implications

The studies reviewed in this paper reflect an increasing recognition of the impact that childhood trauma, particularly emotional abuse, can have on the development of emotion regulation. Furthermore, these findings provide preliminary support that emotion regulation difficulties may contribute to the development and maintenance of psychopathology. In addition to the importance of accurately

assessing for childhood trauma, this highlights the need for clinicians to ask about emotion regulation and consider how an individual understands, relates to and manages their emotions. These findings also suggest that patients with a known history of abuse may benefit from treatments that aim to target emotion regulation difficulties specifically (Steil, Dyer, Priebe, Kleindienst, & Bohus, 2011). For example, the acceptance and mindfulness oriented therapies such as Dialectical Behavior Therapy (Linehan, 1993) and Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 1999) directly address emotion regulation and may be useful interventions for decreasing judgmental, non-accepting responses to emotions and teaching skills for tolerating distress. Further research is needed in this area to determine whether interventions explicitly focused on emotion regulation would benefit survivors of CA.

## 4.5 Conclusion

This review has considered the relationship between childhood trauma and emotion regulation difficulties in adults with a diagnosed mental health disorder. Taken together, the findings provide moderate evidence for a specific link between childhood trauma and emotion regulation difficulties and, at present, the evidence for this association appears strongest for CEA. There is also some evidence to support emotion regulation as a mediator in the relationship between CA, particularly CEA, and mental health difficulties later in life. However, due to the methodological issues raised and the small number of studies reviewed, it is not possible to draw firm conclusions. Future research should aim to address these difficulties and expand the literature by considering multiple mediation models to establish the relative contribution of the range of implicated factors to emotion regulation. This would support a more comprehensive understanding of how early life trauma may impact on the development of adaptive emotion regulation and increase the risk for psychopathology later in life.

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# Appendices

**Appendix 1:** Checklist for rating methodological quality in cross sectional studies (adapted from Gilbert, 2009).

| | | | |
|---|---|---|---|
| **Study (***author, title, reference, year of publication)* | | | |
| **SECTION 1: INTERNAL VALIDITY** | | | |
| **In a well conducted cross-sectional design or before-after design:** | | **In this study the criterion is:** | |
| 1.1 | The study addresses an appropriate and clearly focused question. | Well covered (specifically addresses the systematic review question)<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| **SELECTION OF SUBJECTS** | | | |
| 1.2 | Recruitment is appropriate to the aims of the research. | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| 1.3 | Representative cases from relevant population. | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| 1.4 | The study indicates how many of the people asked to take part did so. | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |

| | | | |
|---|---|---|---|
| 1.5 | Inclusion criteria made explicit and sample characteristics sufficiently described | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| **DATA COLLECTION** | | | |
| 1.6 | Confidence in the quality of individual responses (e.g., tel. Questionnaires might produce better quality answers than postal). | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| 1.7 | Outcome is measured in an objective, standard, valid and reliable way. | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| **CONFOUNDING** | | | |
| 1.9 | The main potential confounders are identified and taken into account in the design and analysis. | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| **STATISTICAL ANALYSIS** | | | |
| 1.10 | Appropriate use of statistical analysis? | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |
| 1.11 | Actual P values reported (e.g., 0.037 rather than < 0.05) for the main outcome except when p value is < 0.001 | Well covered<br>Adequately addressed<br>Poorly addressed | **2**<br>**1**<br>**0** |

## Empirical research project

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# Psychological mechanisms underlying the relationship between childhood trauma and psychosis: exploring the role of emotion regulation

Supervised by Dr Amy Hardy, Dr Caroline Lawlor and Dr Claire Hepworth

# Table of contents

## Abstract

**Aims:** Whilst the association between childhood trauma and psychosis is now well established, the mechanisms underlying this relationship are not yet fully understood. An improved understanding of these mechanisms is imperative as it may contribute to the effectiveness of current psychological interventions for psychosis. Emotion regulation difficulties represent one possible mechanism related to the relationship between childhood trauma and psychosis, consistent with evidence that emotion regulation difficulties are associated with psychosis and are known to be a common consequence of trauma early in life. The current study sought to contribute to the existing literature by examining relationships among emotion regulation, positive psychotic symptoms and childhood trauma in a sample of individuals with a diagnosed schizophrenia-spectrum disorder.

**Method:** Forty-seven participants were recruited from community psychosis services and research registers. Participation involved the completion of a battery of three questionnaires assessing childhood trauma, positive psychotic symptoms and emotion regulation difficulties.

**Results:** Positive psychotic symptoms were significantly associated with childhood trauma and emotion regulation difficulties. Childhood physical abuse was the only abuse type found to be significantly related to emotion regulation. Mediation analysis indicated that difficulties controlling impulsive behaviours when distressed significantly mediated the relationship between childhood trauma and positive psychotic symptoms when controlling for gender.

**Conclusions:** In line with previous research, these findings speak to the relevance of emotion regulation difficulties within this population. They also provide preliminary evidence that emotion regulation plays a role in the association between childhood trauma and the development of psychotic symptoms later in life. This highlights the clinical need to routinely assess for childhood trauma and suggests that emotion regulation may be a promising target for interventions aimed at the prevention and treatment of psychosis.

# 1 Introduction

In recent decades, an increasing body of research has accumulated to show that the experience of trauma early in life considerably increases the risk for psychosis (Varese et al., 2012). However, the mechanisms underlying the relationship between childhood trauma and psychosis remain largely unknown. Research has shown that for people with severe mental health difficulties, a history of childhood trauma is associated with poorer outcomes characterized by a higher number of suicide attempts, earlier onset of psychosis and poor medication adherence (Álvarez et al., 2011; Garno, Goldberg, Ramirez, & Ritzler 2005). Consideration of the mechanisms through which childhood trauma is related to psychosis is therefore important, as this may in turn support the development of effective treatments targeting key processes. Some researchers have proposed that difficulties with emotion regulation, known to be a common consequence of trauma early in life, should be considered as a potential contributory factor in the development, maintenance and course of psychosis (e.g. Livingstone, 2006). In line with this, there is evidence that individuals with psychosis report significant difficulties describing, identifying and managing their emotions (Lincoln, Hartmann, Köther, & Moritz, 2015; O'Driscoll, Laing, & Mason, 2014). Although research has begun to explore the role of emotion regulation in the association between childhood trauma and psychotic symptoms, there remain gaps in our understanding of the difficulties that individuals with psychosis have in understanding and managing their emotions. In addition, there has been relatively little multidimensional assessment of emotion regulation and its associations with childhood trauma in clinical samples. The current study sought to extend the existing literature by exploring associations between childhood trauma and emotion regulation in a sample of adults with clinically significant mental health problems.

## 1.1 Childhood trauma

### 1.1.1 Definition and prevalence

Childhood abuse (CA), is any action by another person that causes significant harm to a child (Butchart, Putney, Furniss, & Kahane, 2006). CA may involve

physical, sexual or emotional harm or neglect, which involves a persistent failure to meet a child's basic physical and/or emotional needs. Although it is difficult to accurately estimate the prevalence of CA, research in recent years has demonstrated that it is common. For example, in a survey of nationally representative British youths, it was estimated that one in five children in the UK today have experienced serious physical abuse, sexual abuse or severe physical and/or emotional neglect at some point in their lifetime (Harker et al., 2013). In addition, this report estimated that for every child identified as needing protection from abuse, another eight are experiencing maltreatment.

### 1.1.2 The long-term impact of childhood trauma

In recent years, substantial evidence has accumulated to show that CA has enduring consequences that can span across many areas of a child's development and serve as a significant risk factor for a variety of negative long-term outcomes in adulthood (Brier & Richards, 2007; Cicchetti & Toth, 1995; Felitti et al., 1998). For example, studies focusing on both community and clinical samples have consistently reported associations among childhood physical, sexual and emotional abuse and the development of depression, substance abuse, post-traumatic stress disorder (PTSD) and suicidal ideation (Briere & Runtz, 1988, Fergusson, Boden, & Horwood, 2008; Min, Farkas, Minnes, & Singer, 2007; Rowan, Foy, Rodriguez, Ryan, 1994; Schaaf & McCanne, 1998). Interpersonal trauma such as CA, which is most often prolonged and repeated, has been argued to be associated with a much more complex pattern of clinical symptomatology than typical PTSD (Herman, 1992) and can lead to the the development of persistent and pervasive impairments in affective, self and relational functioning alongside the core symptoms of post-traumatic stress. In line with this, a number of studies have demonstrated associations between CA and difficulties in emotion regulation, beliefs about oneself as diminished, defeated or worthless and difficulties in sustaining relationships (Cloitre, Miranda, Stovall-McClough, & Han, 2005 ; Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Cole, Martin, & Dennis, 2004; Ehring & Quack, 2010; Herman, 1992).

## 1.2 Childhood abuse and psychosis

Higher rates of CA are reported across the spectrum of psychosis compared to the general population (Kraan, Velthorst, Smit, de Haan, & van der Gaag, 2015; Matheson et al, 2013), though findings have varied depending on the population sampled and methodology used. In line with this, a growing number of prospective cohort, case–control and cross-sectional studies have demonstrated a robust association between CA and the development and maintenance of psychotic symptoms (Bentall et al., 2014; Janssen et al., 2004; Read, Os, Morrison, & Ross, 2005; Varese et al., 2012). Meta-analyses of the literature have reported a medium to large effect of CA on psychosis (Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013) and found that the risk of developing the disorder is almost threefold for people with a history of CA (Varese et al., 2012). Although establishing causality is methodologically complex, the clear temporal sequence between cause and consequence, the existence of a dose-response relationship and consistent findings of a robust association (Varese et al., 2012) indicates that CA may play causal role in the development of psychosis.

A key debate in the literature is whether CA has a generic impact on mental health outcomes or if there is some degree of specificity between certain abuse types and symptoms of psychosis (Bentall et al., 2014; van Dam et al., 2015; van Nierop et al., 2015). The latter hypothesis is based on the possibility that specific types of CA may have different effects on neurodevelopmental, social and emotional processes and might therefore be associated with different symptoms of psychosis (Bentall, Wickham, Shevlin, & Varese, 2012). For example, several studies have found that childhood sexual abuse appears to be a specific risk factor for hallucinations (Hardy et al., 2016; Read, Agar, Argyle, & Aderhold, 2003; Shevlin et al., 2007; Sheffield et al., 2013; Sitko et al. 2014) and hallucinations with content related to trauma have been found in psychosis (Hardy et al., 2005; Reed and Argyle, 1999). Childhood physical abuse and neglect have also been found to be specifically associated with hallucinations, as well as paranoid delusions (Bentall et al., 2012; Shevlin, Dorahy, & Adamson, 2007; Sitko, Bentall, Shevlin, & Sellwood, 2014; Wickham & Bentall, 2016). At present, the association between CA and positive symptoms appears to be more established than for negative symptoms (Bentall et al., 2014), although the latter has been subject to relatively less investigation. For

example, a study conducted by Heins and colleagues (2011) compared the effect sizes for abuse and neglect in relation to distinct symptoms of psychosis in patients, siblings and controls. The authors reported that abuse was more strongly associated with positive symptoms whereas neglect was more strongly related to general psychopathology. This finding was later replicated by van Dam and colleagues (2015), who found that, although associations with abuse were more pronounced for positive symptoms, associations with neglect were comparable for both positive and negative symptom domains. The authors concluded that this divergence suggests that abuse and neglect may differentially impact on domains of psychotic symptomatology. Overall, findings have been equivocal and no agreement has been reached concerning the relative impact of different types of CA on psychosis. Contradictory results may be due to the differences in how CA is assessed and the likely co-occurrence of abuse experiences (Read et al., 2003), which may not always be controlled for. In addition, other aspects of the experience such as the nature, timing, severity and duration of abuse may be more important than the type of abuse per se and this is not always considered.

The association between CA and psychosis is of relevance to improving support provided to people under the care of mental health services, as a history of childhood trauma has been associated with greater functional impairments, higher rates of comorbidities (e.g. substance abuse), suicide attempts and difficulties with engagement, adherence and treatment response (Alamenda et al., 2015; Álvarez et al., 2011; Conus, Cotton, Schimmelmann, McGorry, & Lambert, 2010; Garno, Goldberg, Ramirez, & Ritzler 2005; Trotta, Murray, & Fisher, 2015). Whilst medication can be helpful for some, a substantial number of patients do not respond to antipsychotic medication at all, or continue to experience psychotic symptoms that interfere with their functioning (Case et al., 2011; Lindenmayer, 2000). At present, access to talking therapies is low and associated with only modest effect sizes (Schizophrenia Commission, 2012). Consideration of the underlying factors that play a role in the association between CA and psychosis is therefore important as it may support the development of more effective treatments and better outcomes for individuals with psychosis.

## 1.3 Mechanisms accounting for the CA and psychosis relationship

The observed association between CA and psychosis has led researchers to investigate the various processes by which abuse may lead to symptoms of psychosis later in life, and several pathways have been proposed (Bentall et al., 2014). A number of researchers have attempted to identify mechanisms that are common to the different kinds of CA that have been implicated in psychosis, for example hypothesizing that they all involve a process of social defeat (Selten & Cantor-Graae, 2005). Others have tried to identify specific neural mechanisms that might be involved, for example suggesting that abnormal dopaminergic functioning might be the final pathway linking CA to symptoms (Howes & Murray, 2014). In line with this, Read and colleagues (2001) have proposed and updated (Read, Fosse, Moskowitz, & Perry, 2014) a traumagenic neurodevelopmental model, which proposes that the oversensitivity to stress commonly found in people with psychosis could be the consequence of neurodevelopmental changes to the brain following trauma in the early years of life. Providing support for this model, research has shown that many of the differences between the brains of people diagnosed with schizophrenia and non-clinical groups are the same as the differences that have been found between children who have and have not experienced CA (e.g. structural differences, over reactivity of the hypothalamic–pituitary–adrenal axis, dopamine abnormalities; Read et al., 2014).

Cognitive-behavioural models of psychosis have highlighted how abuse experiences might shape beliefs, intrusions, appraisals and coping responses (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Morrison, 2001). For example, Garety and colleagues (2001) proposed that CA can influence the development of negative schemas about the self and others, biasing attributions of cause towards external sources, and, in the context of distress and/or anomalous experiences, contributing to the subsequent development of psychosis. Thus, they argue that it is the way in which an individual interprets an anomalous experience, rather than the experience itself, that results in the development of psychotic symptoms and the associated distress and disability. It is conceivable that CA might influence how an individual appraises their experiences by promoting the formation of negative beliefs about voices (Andrew, Gray, & Snowden, 2008) and impacting on the individual's perception of the power of

voices, which may mirror life history and social circumstances (Berry, 2012). Bentall and Fernyhough (2008) have suggested that insecure attachment, which can link to difficulties in trusting others, is one factor that can produce a paranoid attributional style, and that paranoia may therefore be especially likely to develop as a consequence of early insecure attachment relationships. This hypothesis is consistent with the finding that being raised in institutional care is specifically associated with paranoia (Bentall et al., 2012) and with the finding that anxious and avoidant attachment fully mediate the relationship between childhood neglect and paranoia (Sitko et al., 2014). Impaired theory of mind and over-anticipation of threat have also been implicated in the relationship between CA and persecutory delusions (Bentall et al., 2008; Corcoran et al., 2008).

Based on the well supported finding (Brookwell, Bentall, & Varese, 2013; Waters, Woodward, Allen, Aleman, & Sommer, 2012) that hallucinations may arise as a consequence of difficulties with source monitoring (the ability to discriminate between internal and external perceptions), some authors have proposed that trauma-related intrusive thoughts and poorly contextualised memories might make individuals particularly susceptible to misattributing the source of inner speech (Waters, Badcock, Michie, & Maybery, 2006). Research indicates that, when engaged in source-monitoring tasks, people with a diagnosis of schizophrenia show a bias toward assuming that the source of their experiences is external to the self, especially when attending to emotionally salient material (Johns et al., 2001). Intrusive thoughts might be particularly susceptible to source misattribution, as studies with hallucinating individuals have shown that low cognitive effort mental events are most prone to source monitoring errors (Bentall et al., 1991). However, some studies have reported no evidence of specific trauma related source monitoring deficits in patients with a history of CA (e.g. Bendall, Jackson, Hulbert, 2011).

The existence of an affective pathway to psychosis has also been proposed (e.g. Myin-Germeys & van Os, 2007). For example, some researchers have suggested that understandable attempts to survive inescapable trauma may become habitual ways of regulating affect and contribute to the onset of psychotic symptoms (Hardy, 2017). Dissociative symptoms, originally arising as attempts to cope with

abuse experiences, are one mechanism which have been posited to play a role in the development of hallucinations (Longden, Madill, & Waterman, 2011). This proposal is consistent with research showing that sexual abuse, particularly by a close relative, is likely to produce a dissociative reaction (Chu and Dill, 1990; Schroeder, Langeland, Fisher, Huber, & Schäfer, 2016) and has also received support from a number of cross-sectional studies demonstrating that dissociation mediates the relationship between CA and hallucinations (Perona-Garcelán et al., 2012; Varese, Barkus, & Bentall, 2011). Other researchers have suggested that the overuse of certain emotion regulation strategies in psychosis (e.g. suppression, emotional avoidance or numbing) may reflect a learned way of coping with intense negative emotions and heightened emotional distress following traumatic events in childhood (Luminet, Rimé, Bagby, & Taylor, 2004) and increase an individual's risk of developing psychosis.

## 1.4 Emotion regulation

As noted above, preliminary evidence suggests that emotion regulation may play a role in the relationship between CA and psychosis. However, to date, there has been little comprehensive investigation of emotion regulation and its association with psychotic symptoms in clinical samples. Broadly speaking, emotion regulation refers to the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions (Thompson, 1994), though it has been defined in the literature in several different ways (see Tull & Aldao, 2015). Some models focus on the *strategies* (e.g., expressive suppression, cognitive reappraisal) that individuals use to manage emotions (Cole, Michel, & Teti, 1994; Gross, 2015; Koole, 2009), while others place emphasis on emotion regulation *abilities* (e.g., understanding and acceptance of emotions) that influence the typical ways in which individuals regard and respond to their emotional experience (Gratz & Roemer, 2004; Hofmann, & Kashdan, 2010; Thompson, 1994). Thus, emotion regulation abilities can be considered a higher order process that likely influence the type, and ultimate success of, emotion regulation strategies an individual uses in any given situation (Tull & Aldao, 2015). Gratz and Roemer (2004) have proposed a clinically useful multidimensional model which conceptualises emotion regulation as adaptive responses to emotional distress (versus efforts to control or suppress emotional arousal). The authors define

emotion regulation as a construct that is characterised by four dimensions: (a) awareness and understanding of one's emotions, (b) acceptance of negative emotions, (c) the ability to successfully engage in goal-directed behaviour and control impulsive behaviour when experiencing negative emotions, and (d) the ability to use situationally appropriate emotion regulation strategies.

## 1.5 The impact of CA on emotion regulation

The ability to regulate emotions develops early in life and parents and other caregivers play a crucial role in structuring, explaining and regulating the emotional world of children (Cole, Michel, & Teti, 1994; Calkins & Hill, 2007; Thompson, 2008). These early experiences are important as they guide the developing child in understanding and labelling their own emotions and embed developing capacities for stress tolerance and emotion regulation. However, when a child grows up in an environment that is abusive and/or neglectful, this can have a considerable impact on the development of adaptive emotion regulation skills (Cicchetti & White, 1990). These environments are often characterised by intolerance towards the expression of emotions, especially displays of negative emotion which, rather than being validated, are often dismissed, punished or trivialized (Linehan, 1993). This can lead individuals to experience emotions as frightening and overwhelming and result in the development of unhelpful beliefs about emotions and how to manage them (e.g. “I must not get upset”; “I must not show my emotions”). Research indicates that the experience of CA limits a child’s opportunities to learn how to recognise and understand emotions, especially negative emotions such as anger, fear and sadness (Pollak & Sinha, 2002; Shipman, Zeman, Penza, & Champion, 2000). Overall, the literature suggests that, compared to non-abused children, those who have experienced CA are less likely to show adaptive emotion regulation skills (e.g., Browne & Finkelhor, 1986; Cicchetti & Howes, 1991; Shipman et al., 2007) and more likely to experience difficulties in accepting emotions, controlling behaviours in the face of emotional distress and in the functional use of emotions as information (Gratz & Roemer, 2004; Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007; Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008; Burns, Jackson, & Harding, 2010).

## 1.6 Emotion regulation in psychosis

Though less extensively studied than the link between CA and emotion regulation, emotion regulation difficulties have also been reported in individuals who have experienced psychosis (Khoury & Lecomte, 2012; O'Driscoll, Laing, & Mason, 2014). For example, research investigating the use of emotion regulation strategies suggests a possible over-reliance on particular strategies (e.g. suppression) and less frequent use of more adaptive strategies (e.g. reappraisal) among individuals with a diagnosis of schizophrenia compared to non-clinical controls (van der Meer, van't Wout, & Aleman, 2009). There is also evidence indicating that the habitual use of expressive suppression is associated with the severity and impact of auditory hallucinations (Badcock, Paulik, & Maybery, 2011) and that lower success in reappraisal is associated with the severity of paranoid delusions (Westermann, Rief, & Lincoln, 2014). The latter finding is in line with general population studies indicating that emotion regulation difficulties are associated with subclinical paranoia (Westermann, Kesting, & Lincoln, 2012; Westermann, Boden, Gross, & Lincoln, 2013). However, findings have been mixed and a number of studies have found that individuals with psychosis do not differ with regard to their reported use of suppression and reappraisal (Badcock et al., 2011; Grezellschak, Lincoln, & Westermann, 2015; Henry, Rendell, Green, McDonald, O'donnell, 2008; Perry, Henry, & Grisham, 2011).

Though few studies have examined specific emotion regulation abilities in psychosis, research indicates that compared to non-clinical controls, individuals with psychosis experience difficulties related to awareness, understanding and acceptance of emotions (Lincoln, Hartmann, Köther, & Moritz, 2015). In addition, Westermann and Lincoln (2011) found that, after taking the level of general psychopathology into account, difficulties controlling impulsive behaviour when distressed were specifically associated with paranoid delusions in a subclinical sample. There is also some evidence to suggest that difficulties in emotion regulation may mediate the relationship between CA and psychosis and a recent general population longitudinal study found that emotion regulation partially mediated the association between CA and the distress associated with positive psychotic symptoms (Lincoln, Marin & Jaya, 2017). Overall, these findings may suggest a significant role of emotion regulation in psychosis, the exact nature of

which remains unclear. Taking into consideration the impact that CA is thought to have on the development of emotion-regulatory processes and research suggesting that stress sensitivity, dissociation and avoidance are associated with positive symptom severity, these findings indicate that emotion regulation may be a particularly important mechanism to consider in the relationship between CA and psychosis.

## 1.7 Aims of the current study

Overall, findings from the current literature support the need for research investigating the role that CA and emotion regulation play in the development and maintenance of positive psychotic symptoms. However, to date, there has been little comprehensive investigation of emotion regulation in psychosis and its impact on the relationship between CA and psychotic symptoms. An improved understanding of the psychological mechanisms underlying this relationship is crucial as it may have important clinical implications for the validity of formulations and the comprehensiveness of treatment planning. As CA seems to influence emotion regulation and difficulties in emotion regulation are reported in psychosis, it seems reasonable to hypothesise that the ability to effectively regulate emotions could at least, in part, explain the relationship between CA and psychosis. The current study aimed to investigate the relationships between CA, emotion regulation and positive psychotic symptoms (auditory hallucinations and persecutory delusions) in a sample of adults diagnosed with a schizophrenia-spectrum disorder. If significant relationships were identified, the study also aimed to explore whether emotion regulation mediated the association between CA and the positive symptoms of psychosis.

## 1.8 Hypotheses

1. CA will be positively associated with positive symptoms.
2. CA will be positively associated with emotion regulation.
3. Emotion regulation will be positively associated with positive symptoms.
4. Emotion regulation will mediate the relationship between CA and positive symptoms.

# 2 Method

## 2.1 Ethical approval

Ethical approval was granted from the Camden & Kings Cross Research Ethics Committee, London (Ref: 16/LO/0869; see Appendix 1a). The Psychosis Clinical Academic Group and the Research and Development department at South London and Maudsley NHS Foundation Trust granted approval for recruitment through community teams, specialist psychological therapies services and a trust-wide register of clients who provided consent to be approached for research participation (see Appendix 1b).

## 2.2 Participants

Participants included 47 people with a diagnosed schizophrenia-spectrum disorder (ICD-10, F20-29). In order to be included in the study, participants had to be aged 18 or over with a diagnosed schizophrenia-spectrum disorder, have a sufficient level of English to read written material and answer questions and have the capacity to provide written informed consent. Participants were excluded if they had a primary diagnosis of intellectual disability, head injury, substance misuse or a known organic cause for psychosis. Participants were recruited from the Psychological Interventions Clinic for outpatients with Psychosis (PICuP) research register and community psychosis services within the South London and Maudsley NHS Foundation Trust.

## 2.3 Measures

### Childhood trauma

The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) is a self-report instrument developed to provide brief, reliable and valid assessment of a broad range of traumatic experiences in childhood. The questionnaire is comprised of 28 items that cover five subscales: emotional abuse (CEA), physical abuse (CPA), sexual abuse (CSA), emotional neglect (CEN) and physical neglect (CPN). Items are rated on a 5-point Likert scale (ranging from 1 = never true to 5 = very often true) and higher scores indicate higher levels of reported abuse, with established cut-offs for determining rates of different types of abuse (Bernstein & Fink, 1998). To

assess recall and reporting biases, the CTQ also includes a minimisation/denial scale. For the purposes of the present study, six CTQ variables were created. Items for each subscale were first summed. Then, consistent with the manner in which these subscales were validated, scores were dichotomised to group participants according to the extent of their maltreatment history for each abuse type (none-low vs moderate-severe). To identify overall none-low vs moderate-severe CA groups, the CTQ total score was also dichotomised based on the 50$^{th}$ percentile of scores. When compared with trauma ratings from child welfare records and reports of family members and clinicians, the CTQ has demonstrated good sensitivity and satisfactory specificity (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997). The questionnaire also demonstrates good convergent and discriminant validity with other measures of trauma and good internal consistency, with Cronbach's alpha coefficient for the subscales ranging from .79 to .94 (Bernstein et al., 1994).

**Psychosis**

The Community Assessment of Psychic Experience (CAPE; Stefanis et al., 2002) is a 42-item self-report questionnaire that is derived from the Delusions Inventory (PDI-21; Peters et al., 1999). The questionnaire consists of 42 items covering three symptom domains: positive, depressive and negative. The CAPE measures psychotic-like symptoms using two 4-point Likert scales, one to indicate the frequency of symptoms (ranging from 1 = never to 4 = nearly always) and one to indicate the associated distress (ranging from 1 = not distressed to 4 = very distressed). It provides an overall score and a total score for each domain by summation of scores on the frequency and distress scales. For the purposes of the current study, only the 20-item positive symptom domain was used. This assesses a range of psychotic experiences, such as unusual or persecutory beliefs (e.g. "Have you ever felt that you were being persecuted in some way?") or hallucinatory phenomena (e.g. "Do you ever hear voices when you are alone?", "Do you ever hear voices talking to each other when you are alone?"). To analyse associations with specific positive symptoms, auditory hallucinations were coded from the voices commenting and voices conversing items and persecutory delusion was coded from the persecution item. The CAPE has proven to be a stable, reliable and valid measure of self-reported psychotic-like experiences in

the general population (Konings et al., 2006) and with clinical samples (Mossaheb et al., 2012). The questionnaire has also demonstrated sufficient discriminant validity (Konings, Bak, Hanssen, Van Os, & Krabbendam, 2006) and good internal consistency, with a Cronbach's α coefficient of .83 (Brenner et al., 2007). The internal consistency of the measure in the current sample was excellent (α = .92).

**Emotion regulation**

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is an empirically validated measure of emotion regulation. It is a 36-item self-report questionnaire that consists of six sub-dimensions: non-acceptance of emotional responses (six items), difficulties engaging in goal-directed behavior when distressed (five items), difficulties controlling impulsive behaviours when distressed (six items), lack of emotional awareness (six items), limited access to emotion regulation strategies (eight items) and lack of emotional clarity (five items). Items are scored on a 5-point Likert scale (ranging from 1 = almost never to 5 = almost always) and higher overall and subscale scores indicate greater difficulties in emotion regulation. Reliability of the DERS is excellent, with a Cronbach's α of .93 and good construct and predictive validity have been demonstrated in adult samples (Gratz & Roemer, 2004). The measure demonstrated excellent internal consistency in the current sample (α = .92).

## 2.4 Procedure

Potential participants were identified through two recruitment routes: community psychosis teams and the PICuP research register. For the former, the research team liaised with community teams within the South London and Maudsley NHS Trust to outline the research and discuss the inclusion criteria and procedure. Potential participants were then identified by members of the clinical teams, who informed them of the study and provided them with a Participant Information Sheet (see Appendix 2). Once a potential participant had expressed an interest and provided verbal consent to be contacted, a researcher then phoned them to discuss the study further and answer any questions. The remaining participants were recruited through the PICuP research register, a database of service users who have provided consent to be contacted for participation in research studies.

As these patients had already provided consent to be contacted, the researcher contacted them directly by phone to provide information about the study.

Those who expressed an interest were sent an information sheet in the post and contacted again at a later date to see if they were interested in participating. All potential participants were given at least 24 hours to decide if they would like to take part. Those who agreed to take part were invited to a research assessment at a location of their choice, if indicated as appropriate after risk assessment. Prior to beginning the research assessment, the researcher went through the information sheet in detail, answered any questions and obtained written informed consent (see Appendix 3) from each participant. Questionnaires were completed with the researcher reading the items aloud and the research assessment lasted approximately one hour on average. Upon completion, participants were debriefed and provided with £15 to reimburse them for any travel expenses incurred.

## 2.5 Power analysis

The relationship between childhood trauma and psychosis has been well established. For example, Janssen and colleagues (2004) reported a large effect of CA on the positive symptoms of psychosis and a meta-analysis of the literature has indicated a medium to large effect of CA on psychosis overall (Matheson et al., 2013). Therefore, assuming a medium to large effect size, it was estimated that a minimum sample size of 42 is necessary to achieve 80% power to test for associations using a multiple regression model with three predictors ($\alpha$=0.05). The sample size may therefore be insufficient to reliably detect small to medium effects, however the constraints of the doctoral thesis timeframe meant that further recruitment was not feasible.

## 2.6 Study design and planned analyses

The current study employed a cross-sectional design to investigate the associations between CA, emotion regulation and the positive symptoms of psychosis. Bivariate correlation analyses (two-tailed) were planned to explore associations among CA, emotion regulation and positive symptoms. In the event that associations were identified, mediation analyses were planned to examine the

potential mediating role of emotion regulation in the relationship between CA and positive symptoms, according to Baron and Kenny's (1986) mediation model. Mediation is a hypothesised causal chain in which an independent variable (X) is thought to affect a mediating variable (M), which in turn affects the dependent variable (Y). In the current study a mediational effect would be found if CA influenced positive symptoms through an indirect path involving emotion regulation. Given the modest sample size, the confidence interval (CI) for the indirect effect was a bootstrapped CI based on 1000 samples. The effect coefficients were only considered significant ($p < .05$) if the bias-corrected bootstrap 95% CI did not include zero (Preacher and Hayes, 2008).

A series of hierarchical multiple regression analyses were conducted to test the proposed mediational model. According to Baron and Kenny (1986), support for the mediational model will be provided if: (a) CA significantly predicts positive psychotic symptoms, (b) CA significantly predicts emotion regulation, (c) emotion regulation significantly predicts positive psychotic symptoms, and (d) the significance of the impact of CA on positive psychotic symptoms reduces once emotion regulation is entered into the equation as an independent variable. To establish that emotion regulation completely mediates the CA-psychosis relationship, the effect of CA on positive symptoms controlling for emotion regulation (path *c'*) should be zero. If CA remains significant but reduces in significance, then partial mediation is indicated.

# 3 Results

## 3.1 Data analysis

Data analysis was conducted using IBM SPSS for windows (version 24). Prior to analysis, all variables were inspected for normality and this indicated a significant deviation from normal distribution on many variables. It was therefore decided to use non-parametric tests of significance, which though more conservative than their parametric equivalents, do not make assumptions about distribution or rely on parameter estimations. A small number of outliers were detected on subscales of the DERS and CTQ but as these appeared to be legitimate scores, they were not corrected. Descriptive statistics were used to describe the sample characteristics and frequencies of participant's scores on all three measures. In order to identify potential covariates for subsequent analyses, a series of linear regression analyses were conducted to examine the impact of demographic factors (i.e. age, gender, ethnicity and diagnosis) on both the independent and dependent variables. Scores on measures of emotion regulation and positive symptoms of psychosis were not associated with ethnic background, gender, age or diagnosis. However, gender was a significant predictor of childhood trauma total scores ($F(1, 45) = 5.25$, $p = .027$) and explained 10.4% of variance. Gender was therefore controlled for in mediation analyses.

## 3.2 Sample characteristics

Fifty people were recruited to the study, however three participants were excluded as they did not have capacity to engage in the assessment. The final sample consisted of 47 participants (male, n = 33, 70.2%) with a mean age of 44.04 years (SD = 10.22, range = 26-62 years). Sixteen (34%) of the participants identified as White British, two (4.3%) identified as White Irish, nine (19.1%) identified as Black British, six (12.8%) identified as Black African, six (12.8%) identified as Black Caribbean, four (8.5%) identified as Asian and four (8.5%) identified as other. Twenty-nine (61.7%) of the participants had a diagnosis of schizophrenia, 11 (23.4%) had a diagnosis of schizoaffective disorder, four (8.5%) had a diagnosis of unspecified non-organic psychosis and three (6.4%) had a diagnosis of delusional disorder. The majority of participants were referred to the

study through contact with community teams (n = 34) and the remainder were recruited from the PICuP research register (n = 13).

## 3.3 Rates of childhood trauma

Overall, 93.6% of participants reported experiencing one or more forms of CA based on established CTQ cut-off scores (Bernstein & Fink, 1998). The most common types of abuse reported were emotional neglect (n = 38, 80.9%) and emotional abuse (n = 44, 72.3%). In addition, 28 (59.6%) participants reported experiencing physical abuse, 27 (57.4%) reported experiencing sexual abuse and 27 (57.4%) reported experiencing physical neglect. Women (Mdn = 66.5) reported significantly higher scores on the CTQ than men (Mdn = 50.0; U = 127.5, Z = -2.41, p = .016). Specifically, women reported significantly greater severity of childhood emotional abuse (U = 139.5, Z = -2.14, p = .032) and emotional neglect (U = 143.5, Z = -2.04, p = .041). The rates of trauma types reported by the sample are presented in Table 1. To determine the co-occurrence amongst the five types of abuse examined, a summary score was created that ranged from 0–5 to signify the total number of abuse types experienced based on whether participants met the cut-off scores for each abuse subtype. Consistent with past findings that sexual, physical, and emotional abuse frequently co-occur (Bernstein et al., 2003; Gratz et al., 2007; Manly, Kim, Rogosch, & Cicchetti, 2001), there was extensive overlap across types of abuse, with 76.6% of participants reporting one form of abuse also reporting other forms of abuse (see Table 2).

## 3.4 Emotion regulation

The means and standard deviations of scores on the DERS are presented in Table 3. Taking into account the number of items in each DERS sub-dimension, participants reported the greatest difficulty in the following three sub-dimensions of emotion regulation respectively: difficulties engaging in goal-directed behavior when distressed, lack of emotional awareness and limited access to emotion regulation strategies.

## 3.5 Positive psychotic symptoms

The means and standard deviations of scores on the CAPE are presented in Table 4.

**Table 1:** Frequency, mean and range of CTQ total and subscale scores

| Abuse type | | Cut-offs | Frequency | | Mean (SD) | Range * |
|---|---|---|---|---|---|---|
| | | | N | % | | |
| **Emotional abuse** | None | 5 - 8 | 13 | 27.7 | 12.55 (5.79) | 5-25 |
| | Low | 9 - 12 | 11 | 23.4 | | |
| | Moderate | 13 - 15 | 9 | 19.1 | | |
| | Severe | ≥ 16 | 14 | 29.8 | | |
| **Physical abuse** | None | 5 - 7 | 19 | 40.4 | 9.85 (4.63) | 5-25 |
| | Low | 8 - 9 | 6 | 12.8 | | |
| | Moderate | 10 - 12 | 8 | 17.0 | | |
| | Severe | ≥ 13 | 14 | 29.8 | | |
| **Sexual abuse** | None | 5 | 20 | 42.6 | 10.23 (5.94) | 5-25 |
| | Low | 6 - 7 | 2 | 4.3 | | |
| | Moderate | 8 - 12 | 8 | 17.0 | | |
| | Severe | ≥ 13 | 17 | 36.2 | | |
| **Emotional neglect** | None | 5 - 9 | 9 | 19.1 | 14.55 (5.68) | 5-25 |
| | Low | 10 - 14 | 11 | 23.4 | | |
| | Moderate | 15 - 17 | 11 | 23.4 | | |
| | Severe | ≥ 18 | 16 | 34.0 | | |
| **Physical neglect** | None | 5 - 7 | 20 | 42.6 | 9.66 (4.13) | 5-25 |
| | Low | 8 -9 | 10 | 21.3 | | |
| | Moderate | 10 - 12 | 6 | 12.8 | | |
| | Severe | ≥ 13 | 11 | 23.4 | | |
| **CTQ total score** | | | | | 56.85 (20.67) | 25-125 |

* Range of possible subscale and total scores

**Table 2:** Number of abuse types reported

| Number of abuse types reported | Frequency | % |
|---|---|---|
| No abuse | 3 | 6.4 |
| One type of abuse | 8 | 17.0 |
| Two types of abuse | 5 | 10.6 |
| Three types of abuse | 3 | 6.4 |
| Four types of abuse | 13 | 27.7 |
| Five types of abuse | 15 | 31.9 |

**Table 3:** Means and standard deviations of DERS scores

| | Non-acceptance | Goals | Impulse | Awareness | Strategies | Clarity | DERS total |
|---|---|---|---|---|---|---|---|
| **Abuse type** | | | | **Mean (SD)** | | | |
| **Emotional abuse** | | | | | | | |
| None-Low | 13.50 (5.63) | 16.79 (4.63) | 11.75 (4.39) | 16.33 (4.16) | 20.79 (7.83) | 11.08 (4.62) | 90.25 (23.10) |
| Moderate-Severe | 14.22 (6.56) | 16.39 (4.01) | 12.91 (4.16) | 17.22 (5.03) | 21.70 (8.05) | 11.91 (3.70) | 94.35 (22.32) |
| **Physical abuse** | | | | | | | |
| None-Low | 12.00 (4.48) | 16.20 (4.44) | 11.28 (4.31) | 17.08 (4.44) | 20.12 (6.69) | 11.40 (4.52) | 88.08 (20.23) |
| Moderate-Severe | 15.95 (6.96) | 17.05 (4.18) | 13.50 (4.00) | 16.41 (4.80) | 22.50 (8.78) | 11.59 (3.84) | 97.00 (24.60) |
| **Sexual abuse** | | | | | | | |
| None-Low | 15.18 (6.71) | 16.86 (4.51) | 12.64 (4.91) | 17.95 (4.68) | 21.41 (8.03) | 12.50 (4.37) | 96.55 (26.78) |
| Moderate-Severe | 12.68 (5.26) | 16.36 (4.18) | 12.04 (3.69) | 15.72 (4.31) | 21.08 (7.87) | 10.60 (3.85) | 88.48 (17.80) |
| **Emotional neglect** | | | | | | | |
| None-Low | 14.35 (6.45) | 17.15 (4.31) | 12.80 (4.83) | 16.80 (4.16) | 19.20 (7.26) | 12.65 (4.60) | 92.95 (24.52) |
| Moderate-Severe | 13.48 (5.83) | 16.19 (4.32) | 11.96 (3.86) | 16.74 (4.94) | 22.74 (8.08) | 10.63 (3.67) | 91.74 (21.48) |
| **Physical neglect** | | | | | | | |
| None-Low | 13.70 (6.09) | 17.17 (4.22) | 12.43 (4.48) | 16.53 (4.13) | 20.63 (7.46) | 11.83 (4.33) | 92.30 (22.55) |
| Moderate-Severe | 14.12 (6.15) | 15.59 (4.37) | 12.12 (4.00) | 17.18 (5.39) | 22.29 (8.66) | 10.88 (3.92) | 92.18 (23.30) |
| **CTQ total** | | | | | | | |
| None-Low | 13.67 (5.70) | 17.04 (4.61) | 12.13 (4.38) | 16.25 (3.94) | 20.92 (7.97) | 11.79 (4.33) | 91.79 (22.79) |
| Moderate-Severe | 14.04 (6.52) | 16.13 (3.99) | 12.52 (4.24) | 17.30 (5.19) | 21.57 (7.92) | 11.17 (4.06) | 92.74 (22.83) |
| **Overall sample** | 13.85 (6.05) | 16.60 (4.30) | 12.32 (4.27) | 16.77 (4.57) | 21.23 (7.86) | 11.49 (4.17) | 92.26 (22.57) |

**Table 4:** Means and standard deviations of CAPE scores

| | Auditory hallucinations (commenting) | Auditory hallucinations (conversing) | Persecutory delusions | Positive symptom total |
|---|---|---|---|---|
| **Abuse type** | | **Mean (SD)** | | |
| **Emotional abuse** | | | | |
| None-Low | 4.88 (2.13) | 3.21 (2.06) | 4.46 (2.21) | 74.21 (18.98) |
| Moderate-Severe | 4.35 (2.08) | 4.30 (2.18) | 5.70 (1.50) | 82.43 (19.27) |
| **Physical abuse** | | | | |
| None-Low | 4.72 (2.05) | 3.24 (1.90) | 4.28 (1.82) | 72.12 (16.89) |
| Moderate-Severe | 4.50 (2.20) | 4.32 (2.36) | 5.95 (1.79) | 85.18 (20.01) |
| **Sexual abuse** | | | | |
| None-Low | 4.59 (2.20) | 3.64 (2.34) | 4.82 (2.22) | 72.36 (19.04) |
| Moderate-Severe | 4.64 (2.06) | 3.84 (2.06) | 5.28 (1.75) | 83.40 (18.50) |
| **Emotional neglect** | 4.95 (2.09) | 3.55 (2.14) | 5.05 (2.19) | 76.70 (20.48) |
| None-Low | 4.37 (2.12) | 3.89 (2.23) | 5.07 (1.83) | 79.37 (18.81) |
| Moderate-Severe | | | | |
| **Physical neglect** | 4.60 (2.27) | 3.43 (2.27) | 4.77 (2.13) | 73.97 (19.68) |
| None-Low | 4.65 (1.84) | 4.29 (1.93) | 5.59 (1.58) | 85.76 (16.79) |
| Moderate-Severe | | | | |
| **CTQ total** | 4.67 (2.10) | 3.21 (1.91) | 4.38 (2.08) | 71.46 (17.21) |
| Low | 4.57 (2.15) | 4.30 (2.32) | 5.78 (1.59) | 85.30 (19.29) |
| High | | | | |
| **Overall sample** | 4.62 (2.10) | 3.74 (2.17) | 5.06 (1.97) | 78.23 (19.37) |

## 3.6 Associations between childhood trauma and positive psychotic symptoms

The results of analyses examining correlations between the CTQ and CAPE positive symptoms are presented in Table 5. Providing support for the first component of the mediation model, CTQ total scores were significantly and positively correlated with persecutory delusions ($r = .35$, $p = .009$) and CAPE positive symptom total scores ($r = .32$, $p = .013$). When examining associations among specific abuse types and positive symptoms, CPA was significantly correlated with CAPE positive symptom total scores ($r = .33$, $p = .012$) and persecutory delusions ($r = .43$, $p = .001$) and CPN was significantly correlated with positive symptom total scores ($r = .31$, $p = .016$). CSA correlated significantly with CAPE positive symptom total scores ($r = .29$, $p = .024$) and CEA was significantly correlated with conversing hallucinations ($r = .30$, $p = .020$) and persecutory

delusions (r = .29, p = .024). CEN was not correlated with any of the positive symptom scores.

## 3.7 Associations between childhood trauma and emotion regulation

Table 6 summarises the correlations between the CTQ and the DERS. The DERS total scores were not significantly correlated with CTQ total scores or any of the CTQ subscales. However, providing partial support for the second component of the mediation model, CPA was significantly correlated with difficulties controlling impulsive behaviours when distressed (r = .31, p = .037). There was also a trend toward significance for the relationship between CPA and non-acceptance of emotional responses (r = .28, p = .059).

## 3.8 Associations between emotion regulation and positive psychotic symptoms

Table 7 summarises the correlations between the DERS and CAPE positive symptoms. Providing support for the third component of the mediation model, the DERS total score was significantly correlated with CAPE positive symptom total scores (r = .30, p = .020), commenting hallucinations (r = .35, p = .008) and conversing hallucinations (r = .31, p = .017). When examining relationships with specific dimensions of the DERS, analyses indicated that non-acceptance of emotional responses (r = .32, p = .014; r = .31, p = .018; r = .29, p = .023) and difficulties controlling impulsive behaviours when distressed (r = .34, p = .002; r = .41, p = .002; r = .36, p = .006) were positively associated with positive symptom total scores, commenting hallucinations and conversing hallucinations respectively. Limited access to emotion regulation strategies was positively associated with commenting hallucinations (r = .33, p = .022) and difficulties engaging in goal-directed behaviour when distressed was significantly correlated with CAPE positive symptom total scores (r = .41, p = .002) and commenting hallucinations (r = .47, p = .001). Persecutory delusions were not significantly associated with any of the DERS sub-dimensions.

**Table 5:** Correlations among childhood trauma and positive symptom variables

| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Emotional abuse | **.62**** | .24 | **.33*** | **.50**** | **.66**** | .21 | -.13 | **.30*** | **.29*** |
| 2. | Physical abuse | | **.28*** | **.29*** | **.36**** | **.53**** | **.33*** | -.06 | .25 | **.43**** |
| 3. | Sexual abuse | | | **.40**** | **.44**** | **.41**** | **.29*** | .01 | .10 | .11 |
| 4. | Emotional neglect | | | | **.47**** | **.58**** | .08 | -.15 | .06 | -.02 |
| 5. | Physical neglect | | | | | **.59**** | **.31*** | .02 | .25 | .17 |
| 6. | CTQ total | | | | | | **.35**** | -.04 | .24 | **.32*** |
| 7. | Positive symptom total | | | | | | | **.57**** | **.62**** | **.59**** |
| 8. | Hallucinations (commenting) | | | | | | | | **.57**** | .12 |
| 9. | Hallucinations (conversing) | | | | | | | | | .12 |
| 10. | Persecutory delusions | | | | | | | | | |

*p<.05, ** p<.01

**Table 6:** Correlations among childhood trauma and emotion regulation variables

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Non-acceptance | **.47**** | **.51**** | .17 | **.53**** | **.49**** | **.75**** | .04 | .28 | -.18 | -.06 | .03 | -.01 |
| 2. Goals | | **.54**** | .09 | **.56**** | **.42**** | **.73**** | -.02 | .12 | -.04 | -.12 | -.17 | -.08 |
| 3. Impulse | | | .23 | **.41**** | **.54**** | **.70**** | .18 | **.31*** | -.06 | -.06 | -.02 | .06 |
| 4. Awareness | | | | .14 | **.56**** | **.42**** | .13 | -.06 | -.21 | -0.2 | .10 | .13 |
| 5. Strategies | | | | | **.40**** | **.80**** | .07 | .13 | -.02 | .22 | .09 | .06 |
| 6. Clarity | | | | | | **.76**** | .14 | .06 | -.20 | -.20 | -.08 | -.05 |
| 7. DERS total | | | | | | | .12 | .19 | -.12 | -.01 | .02 | .02 |
| 8. Emotional abuse | | | | | | | | - | - | - | - | - |
| 9. Physical abuse | | | | | | | | | - | - | - | - |
| 10. Sexual abuse | | | | | | | | | | - | - | - |
| 11. Emotional neglect | | | | | | | | | | | - | - |
| 12. Physical neglect | | | | | | | | | | | | - |
| 13. CTQ total | | | | | | | | | | | | |

*p<.05, ** p<.01

**Table 7:** Correlations among emotion regulation and positive symptom variables

| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|
| 1. Positive symptom total | **.32*** | **.41**** | **.34**** | -.13 | .27 | .08 | **.30*** |
| 2. Hallucinations (commenting) | **.31*** | **.47**** | **.41**** | -.25 | **.33*** | .09 | **.35**** |
| 3. Hallucinations (conversing) | **.29*** | .18 | **.36**** | -.01 | .26 | .13 | **.31*** |
| 4. Persecutory delusions | .12 | .16 | .10 | .03 | -.00 | -.12 | .01 |
| 5. Non-acceptance | | - | - | - | - | - | - |
| 6. Goals | | | - | - | - | - | - |
| 7. Impulse | | | | - | - | - | - |
| 8. Awareness | | | | | - | - | - |
| 9. Strategies | | | | | | - | - |
| 10. Clarity | | | | | | | - |
| 11. DERS total | | | | | | | |

*p<.05, ** p<.01

## 3.9 The role of emotion regulation in the relationship between childhood trauma and positive psychotic symptoms

A series of hierarchical regression analyses were conducted to test the hypothesis that emotion regulation mediates the effect of CA on the positive symptoms of psychosis. Difficulties controlling impulsive behaviours when distressed was the only DERS sub-dimensions found to be uniquely associated with both positive psychotic symptoms (CAPE total symptom score) and CA (CPA). Consequently, analyses testing the proposed mediational model focused on this specific emotion regulation dimension as a mediator of the relationship between CPA and positive symptoms.

Analysis was conducted to explore the mediating role of difficulties controlling impulsive behaviours when distressed in the relationship between CPA and positive symptom total scores when controlling for gender (see Table 8). In the first step, gender did not contribute significantly to the regression model ($F(1, 45) = 0.42$, $p = .519$). The overall model was nonsignificant ($p = .519$) and did not account for any variance in positive symptom scores. In the second step, CPA contributed significantly to the regression ($F(2, 44) = 2.89$, $p = .018$). Gender remained nonsignificant and the overall model approached significance ($p = .066$), accounting for 7.6% of variance in positive symptom scores. In the third step, difficulties controlling impulsive behaviours when distressed was added to the

equation and the model reached statistical significance (p = .022), accounting for 14.3% of variance in positive symptom scores. The impulse sub-dimension contributed significantly to the model (F (3, 43) = 3.56, p = .042) and CPA was no longer significant (F (3, 43) = 3.56, p = .073), indicating a complete mediation effect.

**Table 8:** Hierarchical multiple regression analyses exploring mediating role of difficulties controlling impulsive behaviours when distressed in the relationship between CPA and positive symptoms

*p<.05, ** p<.01, *CI=Confidence interval

| | CAPE positive symptom total | | |
|---|---|---|---|
| Predictor | Adjusted $R^2$ | $\beta$ | 95% CI |
| Step 1 | -.01 | | |
| Gender | | 4.04 | -8.09-15.79 |
| Step 2 | .08 | | |
| Gender | | 0.83 | -10.17-12.32 |
| CPA | | **12.89*** | 2.77-23.36 |
| Step 3 | .14 | | |
| Gender | | 0.10 | -10.74-10.18 |
| CPA | | 10.03 | -1.14-19.92 |
| Impulse | | **1.36*** | 0.16-2.69 |

# 4 Discussion

## 4.1 Summary of findings

The aim of the current study was to extend the existing literature on the association between CA and positive psychotic symptoms by examining emotion regulation as a mechanism that may impact on this relationship. In line with previous findings, the results of our analyses indicated that CA is significantly related to both emotion regulation difficulties and the positive symptoms of psychosis (Lincoln et al., 2015; Varese et al., 2012). Furthermore, findings provide preliminary support for the role of emotion regulation, particularly difficulties controlling impulsive behaviours when distressed, in the relationship between CPA and positive symptoms in people with a diagnosed schizophrenia-spectrum disorder.

## 4.2 Childhood trauma

Consistent with previous findings (Matheson et al., 2013; Morgan and Fisher, 2007; Read, Os, Morrison, & Ross, 2005; Varese et al., 2012), results indicated a high prevalence of CA among a sample of individuals with psychosis, with 93.6% of participants reporting at least one abuse type. This exceeds previously reported prevalence rates of 28% to 73% in clinical samples (Bendall, Jackson, Hulbert, & McGorry, 2008). This is perhaps unsurprising given the sampling bias and is similar to rates reported in other studies with smaller sample sizes and targeted recruitment (Álvarez et al., 2015; Kilcommons & Morrison, 2005). The most prevalent form of CA was CEN (80.9%) and the least common types were CPA and CSA (57.4%). In line with findings among other clinical groups (e.g. Gratz et al., 2007), results indicated an extensive overlap across types of abuse, in that the vast majority of participants reporting one form of abuse also reported other forms. Female participants reported a greater severity of CA, a gender difference that is supported by other studies (Fisher et al., 2009; Shah et al., 2014), as well as a published critical review (Morgan & Fisher, 2007).

## 4.3 Childhood trauma and positive symptoms

As hypothesised, and in line with the extensive literature highlighting CA as a major risk factor for psychosis, CA was significantly associated with global

positive symptoms and persecutory delusions. When examining the individual impact of the different forms of abuse, CPA and CPN were found to be moderately associated with overall positive symptoms. Significant associations were also found between CPA and persecutory delusions. This is line with previous findings of a specific association between CPA and CPN with hallucinations and paranoid delusions (Bentall et al., 2014; Shevlin et al., 2007; Sitko et al., 2014; Wickham & Bentall, 2016). CEA was significantly associated with conversing hallucinations and persecutory delusions, consistent with previous studies (Bentall et al., 2014; Hardy et al., 2016). A moderate significant association was also found between CSA and overall positive symptoms, in line with previous findings (Varese et al., 2012). However, in contrast with what may be considered an established relationship within the literature (McCarthy-Jones, 2011; Sitko et al. 2014), this study failed to find a significant association between SA and auditory hallucinations. This may be due, in part, to underreporting of abuse experiences and/or insufficient power in the present study, given the relatively small sample size that was only powered to detect medium-large effects.

## 4.4 Childhood trauma and emotion regulation

In partial support of our hypotheses, findings from the current study indicated that CPA was significantly associated with difficulties controlling impulsive behaviours when distressed. These results lend support to the theory that CA may disrupt the development of adaptive emotion regulation skills (Shipman et al., 2000; Shipman, Edwards, Brown, Swisher, & Jennings, 2005). The finding of an association between CPA and difficulties controlling impulsive behaviours when distressed is consistent with research demonstrating a relationship between CA and impulsivity (Brodsky et al., 2001). It is also in line with a study by Weiss and colleagues (2013), who found moderate positive associations between CPA and impulse control difficulties among a sample of substance users. These findings indicate that the experience of CPA may increase the risk for later risky or impulsive behaviours, perhaps in an effort to regulate abuse-related emotional distress or simply as a result of heightened emotional arousal (Weiss et al., 2013). Overall, these results provide support for research indicating that, compared to non-abused children, those who have experienced abuse are less likely to show adaptive emotion regulation skills (e.g., Browne & Finkelhor, 1986; Cicchetti &

Howes, 1991; Shipman et al., 2007) and more likely to experience difficulties controlling behaviours in the face of emotional distress (Burns et al., 2010; Gratz & Roemer, 2004).

## 4.5 Emotion regulation and positive symptoms

Difficulties in emotion regulation were higher than that reported in the general population (Gratz & Roemer, 2004) and in line with difficulties that have previously been reported among a sample of adults with severe mental illness (Fowler et al., 2014). Consistent with our hypotheses, global emotion regulation difficulties were significantly associated with overall positive symptoms and auditory hallucinations. The severity of positive symptoms and hallucinations was also significantly associated with several sub-dimensions of emotion regulation abilities, namely difficulties controlling impulsive behaviour and engaging in goal-directed behaviour when distressed, non-acceptance of emotional responses and limited access to emotion regulation strategies. These findings are consistent with research indicating that individuals with psychosis experience difficulties related to the understanding and acceptance of emotions (Lincoln et al., 2015). They are also consistent with findings by Westermann and Lincoln (2011), who reported that difficulties controlling impulsive behaviour when distressed, in particular, were associated with positive symptoms in a subclinical sample. The finding that limited access to emotion regulation strategies is associated with the severity of hallucinations, specifically, provides support for previous findings that the habitual use of expressive suppression is associated with the severity and impact of auditory hallucinations (Badcock, Paulik, & Maybery, 2011). However, while the current study did not find evidence of an association between emotion regulation and persecutory delusions, previous general population studies have shown that difficulties in the use emotion regulation strategies are significantly related to higher levels of delusional ideation (Westermann et al., 2012; Westermann et al., 2013). Overall, findings from the current study highlight the potential importance of understanding the interplay between emotion regulation strategies and individual symptoms of psychosis.

## 4.6 The role of emotion regulation in the relationship between CA and positive psychotic symptoms

The results from the current study provide partial support for the hypothesis that emotion regulation may play a mediating role in the relationship between CA and the positive symptoms of psychosis. These findings are consistent with a recent longitudinal general population study by Lincoln and colleagues (2017), who found that emotion regulation difficulties partially mediated the relationship between CA and positive psychotic symptoms. However, the mediating effect was only found for symptom distress and not for symptom frequency, a distinction that was not examined in the current study. This led the authors to speculate that emotion regulation may be more relevant to the affective symptomatology associated with psychosis rather than to the specific psychotic symptomatology as such. However, the specificity of such findings warrants further research (Lincoln et al., 2017). The results are also in line with another general population study (Laloyaux, Dessart, Van der Linden, Lemaire, & Larøi, 2016), which found that difficulties in the use of emotion regulation strategies mediates the relationship between adverse life events and attenuated positive psychotic symptoms.

In partial support of the hypotheses, mediation analysis indicated that the relationship between CPA and overall positive symptoms was mediated by difficulties controlling impulsive behaviour when distressed. The finding that difficulties controlling impulsive behaviours mediates the relationship between CPA and positive symptoms is in line with findings within other clinical samples (Weiss et al., 2013), which have provided support for the role of impulse control difficulties in the association between CA (both emotional and physical) and probable PTSD within a sample of substance users. Difficulties controlling impulsive behaviours in the face of emotional distress may have important implications for the outcomes of those with psychotic disorders. For example, impulsivity has been found to be associated with substance abuse in a sample of individuals with schizophrenia and substance abuse has been found to be associated with higher rates of suicidality (Gut-Fayand et al., 2001). In line with this, impulsivity has been associated with suicidal and self-destructive behaviours within various adult psychiatric populations and, in individuals with borderline

personality disorder, impulsivity is the personality trait most predictive of suicidal behaviour (Brodsky, Malone, Ellis, Dulit, & Mann, 1997).

Overall, these results lend support to the theory that the development of positive psychotic symptoms may be, in part, related to how one attempts to manage the negative emotions associated with experiencing CA and not just the experience of abuse per se (Shipman et al., 2005; Shipman et al., 2000). More specifically, they suggest that difficulties controlling impulsive behaviours when distressed may account for the associations between CPA, in particular, and the positive symptoms of psychosis. Although there are likely several trajectories leading to the formation of psychotic symptoms, the results of the present study support the hypothesis that difficulties in emotion regulation may be one pathway through which the impact of CA can increase an individual's risk for psychosis later in life.

## 4.7 Limitations

The findings from the current study should be viewed in light of some methodological limitations. Firstly, the study employed a cross-sectional design and so it is impossible to determine the precise nature of the relationships between the variables of interest. In addition, due to the nature of the current study, clinicians may have been more likely to refer patients who are known to have experienced traumatic events in childhood, despite the fact that this was not necessary for inclusion. It is therefore possible that a selection bias was introduced, limiting generalisability of the findings. The current study relied on retrospective accounts of CA and exact details could not be corroborated. Despite strong empirical evidence for the validity of the CTQ (Bernstein et al., 2003), the retrospective and self-report nature of the measure means that it is open to recall and reporting bias, the extent of which is impossible to determine. However, research suggests that trauma histories obtained from those with severe mental health difficulties are reliable (Fisher et al., 2009) and that individuals tend to under-report, rather than overestimate, trauma experiences (Widom, & Courtois, 1997). Furthermore, the CTQ was designed to function as a screening measure for CA and therefore, other potentially relevant aspects of abuse will inevitably not have been measured. This may limit the specificity of results as the extent to which CA leads to later difficulties has been found to depend upon the nature of

the abuse experience, such as the context in which the abuse occurs, the age at which it occurs, the relationship of the perpetrator to the survivor and characteristics of the abuse itself, including severity, force, duration, frequency and resulting injury (Binder et al., 1997; Bolger & Patterson, 2001; Jasinski, Williams, & Siegel, 2000; Johnson, Pike, & Chard, 2001; Rodriguez, Ryan, Rowan, & Foy, 1996; Tremblay, Hébert, & Piché, 1999). Another possible limitation is that the overlap of CA experiences in the current sample made it difficult to clearly distinguish the impact of different types of trauma and the present study had insufficient numbers to control for all abuse types in analyses. Furthermore, those who experience CA are known to be at greater risk of re-victimisation as adults (Desai, Arias, Thompson, & Basile, 2002) and evidence suggests that CA plus adult adversity is particularly harmful (Morgan et al., 2014). Whilst this study aimed to maintain a narrow focus on the impact of CA, not assessing further victimisation experiences may have lowered the predictive ability of the trauma measure.

The current study also relied exclusively on a self-report measure of emotion regulation, which may be influenced by an individual's willingness and/or ability to accurately recall and report on internal experiences. Although the emotion regulation measure utilised in this study is strongly correlated with objective measures of emotion regulation (Gratz & Gunderson, 2006; Tull et al., 2010; Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp, 2009), researchers have noted that self-report measures of emotionality are prone to bias, particularly for individuals with high levels of emotion dysregulation (Tull, Bornovalova, Patterson, Hopko, & Lejuez, 2008). Similarly, reliance on the self-report of psychotic symptoms in the current study may also have been influenced by the participant's awareness of and willingness to talk about their experiences. In addition, while the small sample size in the current study met the sample size required to confer sufficient power to detect medium-large effects for the main hypothesis, the study is underpowered to detect small-medium effects and thus some of the findings may represent type II errors. Furthermore, analyses involved multiple comparisons and caution is therefore required when interpreting the significant associations reported, as these could potentially represent type I errors. Lastly, while the Baron and Kenny (1986) approach to conducting mediation analysis has been widely used in the literature, it is thought to be less

powerful than other methods, such as Hayes and Preacher's (2013) process model. Therefore, it is arguable that conducting mediation analyses using Hayes and Preacher's approach may have been more appropriate.

## 4.8 Clinical implications

Despite these limitations, the results of the current study contribute to the literature examining psychological mechanisms that may underlie the relationship between CA and psychosis. More specifically, findings indicate that emotion regulation is associated with both CA and positive psychotic symptoms and may play an important role in the relationship between CPA, in particular, and symptoms of psychosis. Given the implication of the results for the involvement of CA in positive symptoms, this study supports the growing call for mental health care providers to tailor psychosis services to the specific needs of people affected by CA (Read, Hammersley, & Rudegeair, 2007). For example, our results reinforce the importance of routinely asking about and assessing for the presence of trauma early in life as it would likely be of benefit to consider an individual's abuse history within case conceptualization and treatment planning. Several participants in the current study reported that they had not spoken about their abuse experiences before, despite being in contact with services. In addition, concerns about taking a trauma history from participants were raised in more than one team, highlighting that some clinical staff may be reluctant to explore an individual's history in more detail, a finding that is supported in the literature (Agar, Read, & Bush, 2002). Specific training for staff around the link between traumatic experiences and psychosis may be advisable to ensure a full understanding about the importance of gaining this information.

The results from the current study also highlight the need for clinicians to ask about emotion regulation and consider how an individual understands, relates to and manages their emotions. Findings also suggest that emotion regulation may be a promising target for interventions aimed at the prevention and treatment of psychosis (Khoury & Lecomte, 2012; Steil, Dyer, Priebe, Kleindienst, & Bohus, 2011). For example, incorporating interventions that directly target general emotion regulation may help to decrease judgemental, non-accepting responses to emotions and improve the effectiveness of current psychotherapeutic interventions. In addition, integrating distress tolerance skills (see Linehan, 1993)

into current treatments may help individuals tolerate intense emotional states without immediate action and reduce impulsive behaviour by facilitating engagement in more helpful responses instead. A number of therapies with a focus on promoting the development of emotion regulation skills have already been developed and could readily be combined with other interventions that are known to be helpful with this population. For example, third-wave approaches, such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999), Affect Regulation Training (Berking & Lukas, 2015) and Emotion Focused Therapy (Greenberg, 2002) aim to enhance the ability to accept and tolerate negative emotional states and have shown promising effects in the treatment of psychotic symptoms (Bach & Hayes, 2002; White et al., 2011). The usefulness of incorporating emotion regulation skills within CBT interventions has also been investigated (Berking et al., 2008). Berking and colleagues (2008) compared a traditional CBT with a CBT including specific training in emotion regulation skills among a sample of individuals with various psychiatric diagnoses and found that the inclusion of training in emotion regulation skills enhanced the overall effectiveness of CBT-based treatments. These integrated interventions may have considerable clinical benefit, especially if they are tailored to improve a person's individual profile of emotion regulation skills and abilities (Lincoln et al., 2017). However, further research examining the feasibility and effectiveness of these treatments is needed.

## 4.9 Recommendations for future research

The small sample size of the current study limited the conclusions that could be drawn and replicating the study with a larger sample size is therefore recommended. Future research would also benefit from studies employing a longitudinal design, so that further insight into the causality among relationships could be provided. A more comprehensive assessment of CA is also recommended. For example, including an interview-based assessment such as the Early Trauma Inventory (Bremner, Vermetten, & Mazure, 2000) would allow researchers to examine additional trauma characteristics, such as the onset of abuse, that might have a particular impact on emotion regulation (Ehring & Quack, 2010). In addition, future studies would benefit from the inclusion of measures assessing post-traumatic stress reactions (e.g. PTSD) so that the impact of CA, and not just

it's presence, can be examined in relation to other factors. It would also be useful to assess and control for additional environmental factors in childhood (e.g. neighbourhood environment, bullying and stability in the home) to gain a more complete picture of factors associated with negative outcomes in adulthood (Mahady Wilton, Craig, & Pepler, 2000; McCoy, Roy, & Raver, 2016). Future research should also consider several protective factors, such as sex, education level and family income, that appear to buffer children who are at risk for negative emotional and behavioural outcomes (Campbell-Sills, Forde, & Stein, 2009). In addition, despite the fact that emotion regulation is known to be multifaceted, most studies to date have focused on the use of particular emotion regulation strategies in psychosis and there is a need for more research conducting a more comprehensive assessment of emotion regulation. Future studies would also benefit from the use of a multi-method approach to assess emotion regulation, as combining self-report questionnaires with more objective measures (e.g., experience sampling methods; Csikszentmihalyi & Larson, 1987) would allow researchers to investigate emotion regulation moment by moment and exaine variablility over time. It could also be useful for future studies to include a clinician-rated measure of psychotic symptoms such as the Psychotic Symptom Rating Scales (PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999) alongside self-report measures, as this would increase the validity of findings. Finally, there is a need to develop the clinical implications stemming from this work, including the further development of targeted interventions for individuals with a history of abuse aimed at increasing emotional acceptace and promoting the ability to tolerate negative emotional states (Khoury & Lecomte, 2012).

## 4.10 Conclusions

Despite some limitations, the current study extends previous research by exploring the role of emotion regulation in the relationship between CA and positive psychotic symptoms in a clinical sample. In line with previous literature, the results indicate that CA, positive psychotic symptoms and difficulties in emotion regulation are associated. In addition, findings suggest that difficulties controlling impulsive behaviours when distressed may play an important role in the relationship between CPA, in particular, and positive psychotic symptoms. While it is not possible to draw firm conclusions based on the findings of the

current study, they provide support for research indicating emotion regulation difficulties in psychosis and suggest that these difficulties may be one pathway through which CA leads to the development of psychotic symptoms. These findings highlight the need for clinicians to routinely assess childhood trauma experiences and emotion regulation in individuals with psychosis. They also highlight the potential clinical utility of targeting emotion regulation skills in interventions aimed at increasing well-being and preventing the exacerbation of psychotic symptoms. Despite evidence that CA increases an individual's risk for psychosis, the relationship between CA and psychosis is not direct and not everyone who experiences abuse develops long-term difficulties. Therefore, there are likely to be several factors underlying the relationship between CA and psychosis (Hardy, 2017) and it is crucial that researchers continue to examine individual characteristics that may influence whether, and to what extent, psychotic symptoms develop as a result of CA. A more complex model considering additional variables, such as those described above, may help to further understand the nature of the mediating influences on this relationship.

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# Appendices

**Appendix 1a:** Ethical approval

NHS
Health Research Authority

Miss Michaela Murray
Addiction Sciences Building
4 Windsor Walk
London
SE5 8AF

25 August 2016

Dear Miss Murray

**Letter of HRA Approval**

| | |
|---|---|
| **Study title:** | **Do stressful past experiences affect people's mental wellbeing and how they manage their emotions?** |
| **IRAS project ID:** | **201567** |
| **REC reference:** | **16/LO/0869** |
| **Sponsor** | **King's College London** |

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

**Participation of NHS Organisations in England**

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

*Appendix B* provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities

- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

**Appendices**

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

**After HRA Approval**

The document *"After Ethical Review – guidance for sponsors and investigators",* issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

**Scope**

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

**User Feedback**

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please email the HRA at hra.approval@nhs.net.
Additionally, one of our staff would be happy to call and discuss your experience of HRA Approval.

**HRA Training**

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is **201567**. Please quote this on all correspondence.

Yours sincerely

Dr Claire Cole
Senior Assessor

Email: hra.approval@nhs.net

*Copy to: Mr Keith Brennan, Kings College London (Sponsor Contact)*

*Ms Jennifer Liebscher, South London and Maudsley NHS Foundation Trust (Lead NHS R&D Contact and Co-Sponsor)*

**Appendix 1b:** Confirmation of sponsorship

Dear Michaela

**Study Title: Do stressful past experiences affect people's mental well-being and how they manage their emotions?**

**IRAS Project ID: 201567**

**Co-Sponsors: King's College London and South London and Maudsley NHS Foundation Trust**

I am pleased to advise that your HRA application is now ready for sponsorship and that King's College London and South London and Maudsley NHS Foundation Trust will be co- sponsors for your study. Instructions for requesting sponsor signature, and booking your study for NHS REC review and HRA Assessment are below. Please include a copy of this email with your application to the REC and HRA.

I can confirm for the purposes of the HRA application that South London and Maudsley NHS Foundation Trust as the co-sponsor and Trust organisation hosting the study has determined that it has acquired the relevant information during the funding and protocol development stages of the study, and therefore does not require a Statement of Activities or Schedule of Events.

Important: If the HRA advise that you make any changes to your application before the review, please contact me to discuss before making these changes.

If you find you need to make any other changes to the submission please also let me know what these are before making the changes. Thanks for your co-operation with this.

Keith Brennan is the sponsor signatory for King's College London and will sign the sponsor declaration of your IRAS HRA application. Please find attached a guidance document for requesting electronic signatures for IRAS applications, the email to request Keith's signature is keith.brennan@kcl.ac.uk. I have copied Susan Dickson, Keith's PA into this so she is aware that you will be requesting his signature.

Details of how to book and submit your HRA application can be found here: http://www.hra.nhs.uk/resources/hra-approval-applicant-guidance/applying-for-hra-approval/.

When you have made the booking you will receive a confirmation email. You will need to enter some of the information from that email into the first page of the IRAS application – please do not amend any other part of the IRAS form or the sponsor and CI signatures will be invalidated.

I have attached the KCL indemnity documents 2015-16 which go with the HRA submission.

Please could you copy our office into all of your correspondence with the REC and the HRA.

If you have any questions or encounter any problems with the submission please let me know.

Best wishes

Jenny

**********

Jenny Liebscher
R&D Governance Manager

Joint R&D Office of South London and Maudsley NHS Foundation Trust and Institute of Psychiatry, Psychology & Neuroscience (IoPPN)

PO05, Institute of Psychiatry, Psychology & Neuroscience (IoPPN)

020 7848 0251
jennifer.liebscher@kcl.ac.uk

*Visit the R&D Office web pages at Research and Development Office*

*Please see details of training and resources on our R&D website: http://www.kcl.ac.uk/ioppn/research/office/Training-Resources/Training-Resources-1.aspx*

*Read SLaM's R&D Operational Capability Statement at R and D SLaM Operational Capability Statement 2014-2015*

**Appendix 2:** Participant Information Sheet

## Do stressful past experiences affect people's mental wellbeing and how they manage their emotions?

### Participant Information Sheet

We would like to invite you to take part in a project. Before you decide it is important for you to understand why the project is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. You are welcome to ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this information.

### Part 1

**Why is the study being done?**
Research suggests that experiences such as seeing visions, worries about other people being harmed or other beliefs may be linked to difficult or upsetting events in childhood. We want to better understand links between past childhood experiences, wellbeing and how people manage their emotions in order to improve the support that can be offered to people.

**Why have I been invited?**
We are inviting you to participate because your keyworker has informed us that you would be happy to be contacted by someone from our research team. Alternatively you may have been contacted as your name is on a research register that you have agreed to be part of, or you may have seen an advert for this research and contacted us. At this point we have no other information about you and will not access any further information without your consent.

**Do I have to take part?**
It is up to you whether or not you decide to take part. If you decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you can leave the study at any time without giving a reason. A decision to withdraw at any time, or a decision not to take part, **will not** affect any other aspect of your current or future care.

**What will happen to me if I take part?**
If you are interested in taking part you will meet with a researcher to complete a set of questionnaires about some of your childhood experiences, current difficulties and how you manage emotions. We expect that this meeting will take between one and two hours in total. This can be completed in one session or over multiple sessions if you would prefer shorter meetings. You will not be asked to discuss your experiences in detail. We will ask you if it would be ok for the researcher to audio-record the meeting they have with you to make sure they capture what you say to them accurately and to reflect on their interview approach. This is completely your choice and if you are ok with the interview

being recording then this information will be kept secure (see below). You may decline permission for us to record at any time and still take part in the research.

**Will I be reimbursed for any expenses?**
Yes. You will receive £15 for completing the research assessment, to cover any expenses and reimburse you for your time.

**What are the disadvantages and risks of taking part?**
As described above, you will be required to answer questions about stressful childhood experiences that you may have had. Although you will not need to describe these experiences in lots of detail, being asked some questions about them and bringing it to mind may be distressing for some people. If this was to happen, it will be possible for a member of your mental health team to speak with you if you would find that helpful. You will also be provided with contact details for the researcher should you wish to express concerns or ask any further questions following the meeting. You will be free to withdraw from the project at any time.

**What are the possible benefits of taking part?**
Sometimes people find completing questionnaires and being interviewed interesting or a useful opportunity to reflect on things. For example, it may draw attention to things that are currently going well or things that you might want more support with. If you feel that it would be helpful, we can give a summary of the information you share with the researchers to the mental health professionals involved in your care so that they have a better idea of things that you might want further support with. We will not do this if you do not want us to. The information that participants provide will also help us to better understand the links between past experiences, wellbeing and how people cope with emotions and it is hoped that this will help us to develop better treatments.

**What if there is a problem?**
Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

**This completes Part 1 of the Information Sheet. If the information in Part 1 has interested you and you are considering participating, please continue to read the additional information in Part 2 before making any decision.**

**Part 2**

**What if there is a problem?**
If you have a concern about any aspect of this study you should speak to the researchers who will do their best to answer your questions (contact details below). If you remain unhappy and wish to complain formally, you can do this through the NHS complaints procedure. Details can be obtained from your local hospital or team base.

**Will my taking part in the project be confidential?**
We will inform your clinical team that you are taking part in the study. Otherwise, all the information collected about you will be kept strictly confidential and will

conform to the Data Protection Act of 1998 with respect to data collection, storage and destruction. After you have completed the questionnaires your name will be removed from all the information collected so that it is anonymous and you cannot be recognised from it. Paper copies of questionnaires will be kept securely by the researchers in a locked filing cabinet in a locked office. One exception to this is if you give information that suggests you or someone else is at risk of harm. If this occurs we will need to share the information with your health care team.

**What will happen to the results of the study?**
The results will be included in Michaela Murray's doctoral thesis as part of her training at King's College London to become a clinical psychologist. She will also aim to publish the results in a scientific journal. The results of the study will be made available to all participants in a non-scientific format. You will not be identifiable in any of these reports. If you would like to receive a summary of the results you will be asked to indicate this during your meeting with the researcher.

**Who has reviewed the study?**
All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study have been reviewed and approved by South London and Maudsley NHS Trust 's Research Ethics Committee.

**Who is organising the research?**
The project is organised by the South London and Maudsley NHS Trust and the Institute of Psychiatry at King's College London.

**Contact for further information**
If you require further information about the study you may contact one of the following people:

| Name and title | Role in the project | Contact details |
|---|---|---|
| Michaela Murray<br><br>Trainee Clinical Psychologist | Researcher | Phone: 07716175281<br><br>Email: michaela.j.murray@kcl.ac.uk |
| Dr Amy Hardy<br><br>Research Clinical Psychologist | Academic supervisor | Email: amy.hardy@kcl.ac.uk |
| Dr Caroline Lawlor<br><br>Senior Clinical Psychologist | Academic supervisor | Email: caroline.lawlor@slam.nhs.uk |
| Dr Claire Hepworth<br><br>Senior Clinical Psychologist | Academic supervisor | Email: claire.hepworth@slam.nhs.uk |

**Thank you for taking the time to read this information.**

**Appendix 3:** Participant consent form

**Patient Identification Number:**

**One copy to participant and one copy for researcher site file.**

**CONSENT FORM**

**Title of Project:** How do childhood traumatic events impact on how we manage emotions and unusual experiences?
**Name of Researchers**: Michaela Murray, Dr Amy Hardy, Dr Caroline Lawlor, Dr Claire Hepworth

**Please initial all boxes:**

1. I confirm that I have read the information sheet dated..... (version.....) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

3. I understand that sections of my medical notes may be looked at by the researchers, if it is relevant to my taking part in this research (for example, to get an address, age, or to confirm clinical information). I give permission to these individuals to have access to my records for this purpose.

4. I understand that information relating to me taking part in this study will be stored on an electronic database for up to 7 years

5. I agree to take part in the above study.

| | | |
|---|---|---|
| Name of Participant | Date | Signature |
| Name of Person taking consent | Date | Signature |